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**WATERSHED PLAN
AND
ENVIRONMENTAL IMPACT STATEMENT**

DEPOSIT WATERSHED

**BROOME, CHENANGO AND DELAWARE COUNTIES
NEW YORK**



**U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Syracuse, New York**



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WATERSHED PLAN
AND
ENVIRONMENTAL IMPACT STATEMENT

DEPOSIT WATERSHED

Broome, Chenango, and Delaware Counties, New York

Prepared under the Authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001-1008) and in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 USC 4321 et seq.).

Prepared by: Village of Deposit
County of Broome
Delaware County Board of Supervisors
Broome County Soil and Water Conservation District
Delaware County Soil and Water Conservation District
U. S. Department of Agriculture, Soil Conservation Service
U. S. Department of Agriculture, Forest Service

September 1977

U. S. E.P.A. - DEC 29 1978

DEC 29 1978

BALTIMORE - PREP.

PREFACE

Enclosed are two documents--the Watershed Plan and Environmental Impact Statement for Deposit Watershed, New York.

The Watershed Plan has been developed by the local sponsors with the assistance of the U. S. Department of Agriculture and is the basis for the authorization of federal assistance to implement the proposed project in accordance with the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001-1008).

The Environmental Impact Statement has been prepared by the U. S. Department of Agriculture in compliance with Section 102(2)(C) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 USC 4321 et seq).

The Environmental Impact Statement contains the detailed information on project area, planned project, problems, impacts, alternatives, etc.

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WATERSHED PLAN

DEPOSIT WATERSHED

Broome, Chenango, and Delaware Counties, New York

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Deposit Watershed Plan
Broome, Chenango, and Delaware Counties

SUMMARY AND DESCRIPTION

Deposit Watershed, located in southeastern New York, has a drainage area of 48,437 acres. The Sponsoring Local Organizations are the village of Deposit, the County of Broome, the Delaware County Board of Supervisors, the Broome County Soil and Water Conservation District, and the Delaware County Soil and Water Conservation District.

The major soil and water resource problems include urban flooding along Bone Creek, Butler-Big Hollow Creek, and Oquaga Creek (near Deposit); agricultural flooding along Oquaga Creek; streambank erosion on all major streams; and need for fish habitat on Oquaga Creek.

Estimated average annual losses of \$83,830 due to property damage and reduced services are occurring in the watershed. In addition, \$9,325 of added flood plain urban development (floodproofing) costs are incurred annually. The present value of the floodproofing costs is about \$146,000.

The plan provides for the installation of land treatment measures, two floodwater retarding structures, two channels, and two dikes. The land treatment measures and structural measures will be installed during a 5-year installation period.

Installation of the land treatment measures will reduce erosion rates on erosive cropland to 3.0 tons per acre annually. Sediment concentrations in the Bone, Butler-Big Hollow area and Oquaga Creek will be reduced from 219 to 170 milligrams per liter (mg/l) and 146 to 142 mg/l, respectively. Installation of structural measures will reduce average annual floodwater damages to urban areas by 98 percent and all identified flood damages by 96 percent from floods up to the magnitude of the 100-year frequency.

About 33 acres of land will be committed to the installation of structural measures. Present land use includes 1 acre of cropland, 4 acres of pasture, 18 acres of open land formerly cropped,

3 acres of forest land, 2 acres of urban land, 2 acres of other land, and 3 acres of water. Additional commitments will include 900 feet of intermittent stream. Acreage committed to structural measures will become permanent grassland with the exception of 1 acre which will become concrete-channel and 2 acres which will be converted to water.

The Broome County and Delaware County Soil and Water Conservation Districts will be responsible for planning land treatment measures with technical assistance provided by the Soil Conservation Service and the Forest Service. Landowners and operators, with assistance furnished by the Soil Conservation Service and Forest Service, will be responsible for establishing and maintaining these practices. The County of Broome and the Delaware County Board of Supervisors, will provide landrights, and the Soil Conservation Service will provide engineering services required for the installation of the structural measures. The County of Broome will let and administer construction contracts. However, at a later date, the Sponsors may request the Service to perform this function. The Sponsors and the Service will bear project administration costs that each incurs.

Total installation cost of the combined land treatment and structural measures is about \$2,102,400. Of this amount, \$1,469,200 will be paid by P.L. 566 funds and \$633,200 will be paid by other funds.

Total land treatment cost is \$692,400, including \$154,100 from P.L. 566 funds for technical assistance, and \$538,300 from other funds. Total structural measures cost is \$1,410,000, including \$1,315,100 from P.L. 566 funds, and \$94,900 from other funds.

The average annual operation and maintenance cost of \$2,200 for the structural measures will be borne and financed by the County of Broome. The average annual cost of the structural measures is estimated to be \$92,260. These measures are expected to produce average annual benefits of \$99,485. The ratio of the total average annual benefits to the average annual cost of structural measures is 1.1 to 1.0.

All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service and the Forest Service of the United States Department of Agriculture.

PLANNED PROJECT

The following is a brief summary of the proposed action. A more detailed description of project measures to be installed can be found in the "Planned Project" section of the Environmental Impact Statement.

This plan provides for the installation of land treatment measures, two floodwater retarding structures, two channels, and two dikes. The land treatment measures and structural measures will be installed during a 5-year installation period.

It has been agreed by the soil and water conservation districts, community leaders, landowners, and state and federal agencies that adequate land treatment should be applied to 1,825 acres of cropland and adequate protection should be applied to 3,175 acres of forest land during the 5-year installation period (Table 1).

Technical assistance will be provided to plan land use changes, install needed conservation measures, manage watershed resources, and maintain conservation measures. Assistance will be given to planning and zoning boards, community leaders, and land developers in the proper use, treatment, and development of resources. General technical assistance will also be provided for environmental education and stimulation of landowners to participate in good land management practices.

The floodwater retarding structures will control 1.47 square miles of drainage area or 2 percent of the total watershed area. Both structures are earthfill dams with a design life of 100 years and will control runoff from storms up to the 100-year frequency event.

The Bone Creek floodwater retarding structure will be a 66-foot high earthfill dam with a drainage area of 1.27 square miles, and no permanent water storage allocation. The structure will have a single stage reinforced concrete drop inlet principal spillway with an energy dissipater and a vegetated earth emergency spillway. The dam will provide capacity for a total of 23.3 acre-feet of submerged sediment, and 34.5 acre-feet of floodwater storage. The floodwater detention storage will empty in less than one day. Minimum land area required for construction will be 10 acres.

The Palmer Pond floodwater retarding structure will be a 28 foot high dam with a reinforced concrete drop spillway and a vegetated earth emergency spillway, and no permanent water storage allocation. A diversion, 1,600 feet long will divert flow from 47 acres into the pond; a rock riprap channel 270 feet long, is located below the structure to carry water to Big Hollow Creek. The dam will provide capacity for a total of 3.2 acre-feet of submerged sediment, and 32 acre-feet of floodwater storage. The floodwater detention storage will empty in less than 3 days. Minimum land area required for construction will be 16 acres.

Bone Creek channel, in the village of Deposit, requires about 1,300 feet of channel rehabilitation. The repair work consists of the removal and replacement of deteriorated concrete walls, removal of trees that are putting pressure on the existing walls, and replacement of concrete eroded from the channel floor.

The Elm Street diversion will consist of about 4,400 feet of earthen dikes along Butler Brook and Big Hollow Creek; an inlet structure on Butler Brook; about 700 feet of newly constructed reinforced concrete channel; and an appropriate energy dissipating device for discharging Butler Brook and Big Hollow Creek waters into the Delaware River.

The dikes will have a top width of 10 feet and the side slopes will be 3 feet horizontal to 1 foot vertical. The straight inlet will be a reinforced concrete structure 55 feet in length, 18 feet in width, and 11 feet in height. The reinforced concrete channel will be 9 feet deep and 22 feet wide, and will be fenced along its entire length. Minimum land area required will be 6 acres. Low flow discharge will be permitted through the existing channel downstream by an appropriate division structure.

The Borden Street dike will consist of about 1,800 feet of earthen dike with a top width of 10 feet and an average height of about 4 feet.

The Marsh Creek dike and trash rack will consist of about 500 feet of earthen dike with a top width of 10 feet and an average height of about 5 feet.

Side slopes for Borden Street and Marsh Creek dikes will be 3 feet horizontal to 1 foot vertical. Minimum land area required for both structures will be 6 acres.

Each contract will require that contractors adhere to strict specifications for minimizing soil erosion, water, noise, and air pollution during construction. The specifications will include provisions for measures, such as sediment basins and temporary vegetation and mulching, to protect exposed areas until permanent vegetation is established. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits. Pollution of surface acres or ground water by chemicals, fuel, lubricants, sewage, and other pollutants will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with the New York Forest Practice Act and other applicable state and local laws. A barrier (i.e., plastic filter cloth) will be installed at the downstream end of the channel work when necessary to minimize the chances of sediment from reaching the downstream fishery during excavation.

Requirements for safety and health, in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54), will be included in each construction contract. Design and construction will comply with applicable state laws.

There is no storage specifically provided for recreational use. Adequate provisions will be made to exclude the public to prevent the creation of unsanitary conditions from concentrations of litter and human waste. If public use is allowed in the future, the Sponsors will provide adequate sanitary facilities to serve the use contemplated.

The Plan has been coordinated with the Division of Historic Preservation, New York State Parks and Recreation. Investigations to date indicate that the project will not encroach on any historic place or any places planned for historic preservation. If artifacts or other items of archeological or historic significance are uncovered by the Soil Conservation Service, or brought to its attention by others prior to or during construction, the State Commissioner of Parks and Recreation and the National Park Service will be notified. Construction will not begin or continue until appropriate arrangements for survey or salvage have been made.

INSTALLATION COSTS - MONETARY

The total installation cost of the works of improvement is estimated to be \$2,102,400. Total installation cost includes \$692,400 for establishing land treatment measures on private land and \$1,410,000 for structural measures. Table 1 contains further cost information.

Land treatment costs include P.L. 566 funds of \$154,100 to be used by the Soil Conservation Service and Forest Service, to provide accelerated technical assistance; regular Soil Conservation Service program funds of \$5,000 and current cooperative federal-state forestry program funds of \$13,200 for technical assistance to continue the going program and costs of \$70,700 for applying land treatment.

The total installation costs of structural measures includes costs for construction, engineering services, landrights, and project administration.

Construction costs include estimated contract costs plus a contingency allowance of 12 percent. All costs are based on estimated quantities and current (1977) unit costs. The unit costs were obtained from actual bid prices for similar works constructed in the state and from costs submitted by material supply firms. Construction costs include such items as excavation, seeding, concrete, and earthfill. The estimated construction cost is \$1,034,100.

Engineering services costs include the direct cost of engineers and other technicians for surveys, engineering and geologic investigations, design and preparation of plans and specifications for structural measures, including associated vegetative work. The costs for engineering services are estimated at \$135,000.

Relocation payments include moving and related expenses for a displaced person, business, or farm operation. In addition, financial assistance is available for replacement housing for a displaced person who qualifies and whose dwelling is acquired because of the project. No relocations are anticipated.

Project administration costs include the costs incurred for layout, inspection, relocation assistance advisory services (when relocation occurs), administration of contracts, and other administrative

and clerical services necessary to install the project. Project administration costs are estimated to be \$165,100.

Landrights costs were estimated to be \$75,800 and include all expenditures to be made in acquiring land and/or easements, needed permits, changing existing utilities, replacing culverts and bridges, and constructing access roads. These costs include \$12,500 for bridges, and \$63,300 for survey, legal fees, land, installation of fences, value of trees to be removed, and other costs. Landrights costs were determined with the cooperation of the local Sponsors.

The cost for each major structural measure has been determined individually as shown in Table 2.

Actual cost sharing between P.L. 566 cost and other cost can be found in the "Agreement" section of the plan.

ECONOMIC BENEFITS ^{1/}

Direct flood damage will be reduced by \$72,000, sediment damage will be reduced by \$1,370, and indirect flood damage will be reduced by \$6,890 (Table 5).

Changed land use benefits involve reduced urban development cost.

Total structural measure benefits are \$99,485, including flood damage reduction benefits of \$80,260 and employment benefits of \$9,900, changed land use benefits of \$9,325 (Table 6).

The ratio of the total average annual project benefits of \$99,485 to the average annual cost of structural measures \$92,260 is about 1.1. Table 6 shows a summary of benefits, cost, and the benefits to cost ratio.

1/ All monetary values shown are average annual amounts.

INSTALLATION AND FINANCING

Federal assistance, financial and other, to be furnished by the Soil Conservation Service in carrying out the project, is contingent on the appropriation of funds for this purpose. Before federal funds are made available, the Sponsoring Local Organization will:

1. Give assurances that all necessary landrights have been secured.
2. Provide for administering the contracts.
3. Execute a project agreement.

Technical assistance funds for forestry activities will be provided through P.L. 566 and the going cooperative programs of the Forest Service.

The Broome County, the Delaware County, and the Chenango County Agricultural Stabilization and Conservation Committees will provide cost sharing assistance to farmers in the watershed for installation of land treatment measures in accordance with provisions of the program in effect at the time assistance is provided.

The Farmers Home Administration will give special consideration to eligible farm families in the way of credit and farm management guidance to establish the necessary land treatment measures and improve farm income. This assistance may vary over the years as the regulations pertaining to Farmers Home Administration loan programs are altered to meet changing conditions. See Table A for land treatment installation by landowners and operators.

TABLE A - SCHEDULE OF OBLIGATIONS - LAND TREATMENT

(Dollars) 1/

Year	Public Law 566 Funds	Other Funds	Total
1	34,100	100,000	134,100
2	30,000	100,000	130,000
3	30,000	100,000	130,000
4	30,000	100,000	130,000
5	30,000	138,300	168,300
TOTAL	154,100	538,300	692,400

1/ Price base: 1976

The County of Broome and the Delaware County Board of Supervisors will bear the landrights costs associated with the installation of the structural measures in their respective counties. Funds for these establishment expenses and landrights costs will be provided through procedures prescribed in New York State's enabling legislation (County Law). Under provisions of County Law, up to 50 percent of the costs of landrights needed for flood prevention may be reimbursable through New York State funding. The schedule of obligations for structural measures is shown on Table B.

Obtaining the funds needed to apply the land treatment measures will be the responsibility of the individual landowners and operators, utilizing costs sharing assistance as may be available for approved practices. Complete program implementation is, however, contingent upon the availability of associated funding. The funds for technical assistance will be provided through the ongoing and accelerated programs of the U.S. Forest Service, the Soil Conservation Service, the Soil and Water Conservation Districts and the Cooperative Forestry Programs of the New York State Department of Environmental Conservation. If more funds are needed due to a more rapid program acceleration than expected, a supplement to the plan can be submitted.

The County of Broome, and the Delaware County Board of Supervisors can provide sufficient funds to acquire all of the landrights needs for the project, have legal authority necessary to obtain landrights, and will:

1. Provide the necessary landrights including all needed permits for all structural measures. They will obtain landrights through condemnation, if necessary. Appraisals will be obtained as a prerequisite to securing landrights in accordance with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894). The county of Broome will be responsible for landrights involving structural measures in Broome County, and the Delaware County Board of Supervisors will be responsible for landrights involving structural measures in Delaware County. Broome County and Delaware County general funds, without P.L. 566 cost sharing assistance, will provide for their respective landrights costs.
2. Provide for the administration of construction contracts and for such inspection and other administrative services as it requires for installation of structural measures, without P.L. 566 cost sharing assistance. Broome County will be responsible for all contracting. The Sponsors, at a later date, may request the Soil Conservation Service to administer contracts.

TABLE B - SCHEDULE OF OBLIGATIONS - STRUCTURAL MEASURES

(Dollars) 1/

Fiscal Year	Measures	P.L. 566 Funds	Other Funds	Total
<u>First</u>	Engineering Services	30,000		30,000
	Landrights		40,000	40,000
	Project Administration	26,000	4,000	30,000
<u>First Year Totals</u>		56,000	44,000	100,000
<u>Second</u>	Engineering Services	30,000		30,000
	Landrights		20,000	20,000
	Project Administration	30,000	4,000	34,000
	Structural Measures	300,000		300,000
<u>Second Year Totals</u>		360,000	24,000	384,000
<u>Third</u>	Engineering Services	30,000		30,000
	Landrights		15,800	15,800
	Project Administration	30,000	4,000	34,000
	Structural Measures	300,000		300,000
<u>Third Year Totals</u>		360,000	19,800	379,800
<u>Fourth</u>	Engineering Services	30,000		30,000
	Project Administration	30,000	4,000	34,000
	Structural Measures	300,000		300,000
<u>Fourth Year Totals</u>		360,000	4,000	364,000
<u>Fifth</u>	Engineering Services	15,000		15,000
	Project Administration	30,000	3,100	33,100
	Structural Measures	134,100		134,100
<u>Fifth Year Totals</u>		179,100	3,100	182,200
<u>Totals</u>		1,315,100	94,900	1,410,000

1/ Price base: 1976

Prior to entering into agreements that obligate funds of the Soil Conservation Service, the County of Broome and the Delaware County Board of Supervisors will develop a code of conduct governing the performance of its officers, employees, or agents in contracting with or expending P.L. 566 funds; and a financial management system for control, accountability, and disclosure of P.L. 566 funds received and for control and accountability for property and other assets purchased with

P.L. 566 funds. Program income earned during the grant period will be reported on the Sponsors request for allowance or reimbursement from the Service.

3. Request the assistance of the Cooperative Extension Service, through their agents and specialists, in developing and carrying out the watershed information and education program.
4. Request the cooperation of lending agencies, such as local banks, the Farmers Home Administration, the Production Credit Association, and the Federal Land Bank, to provide loans to help cooperating landowners and operators install needed treatment measures.
5. Provide relocation assistance advisory services, when necessary, to include providing current and continuing information on the availability prices, and rentals, of comparable decent, safe, and sanitary sales and rental housing; supply information concerning federal and state housing programs, disaster loan programs, and other federal or state programs offering assistance to displaced persons; and provide other advisory services to displaced persons in order to minimize hardships to such persons in adjusting to relocation. These services will be provided without P.L. 566 cost sharing assistance.

The County of Broome will provide necessary relocation assistance services for measures to be installed in Broome County and the Delaware County Board of Supervisors will provide necessary relocation services for measures to be installed in Delaware County.

6. As part of project administration, provide personally, or by certified or registered first class mail, written notice of displacement, at least 90 days before displaced persons have to move, and appropriate application forms to each individual, family, business, or farm operation to be displaced; assist in filing applications, review and take action on applications for relocation assistance; review and process grievances in connection with displacements; and make relocation payments.

Broome County will be responsible for such notices that are applicable to structural measures to be installed in Broome County; likewise, the Delaware County Board of Supervisors will be responsible for structural measures to be installed in Delaware County. The Service will assist in fulfilling these responsibilities.

7. Provide for operation and maintenance of structural measures. These costs will be provided by Broome County general funds. The County of Broome will be responsible for operations and maintenance of all structural measures.

The Broome, Delaware, and Chenango County Soil and Water Conservation Districts will be responsible for providing assistance to landowners and operators to help them plan, establish, and maintain land treatment measures. The land treatment measures will be installed at approximately uniform annual rates over the 5-year installation period. Installation of similar measures required to meet the total conservation needs will be continued thereafter.

The Soil Conservation Service will:

1. Under the Broome, Delaware, and Chenango Soil and Water Conservation Districts' Memorandums of Understanding with the U.S. Department of Agriculture, provide technical assistance for planning, installing, and maintaining conservation measures.
2. Furnish engineering services for the surveys, layouts, design, and preparation of plans and specifications for the structural measures.
3. Provide for project administration services, including a government representative to administer the expenditure of federal funds, and ensure that all structural measures are installed in accordance with plans and specifications.
4. Will, if cultural values are discovered during construction, dispatch an appropriate notice to the Secretary of the Interior in accordance with Section 3 of P.L. 93-291.

The Forest Service will:

Provide guidance and direction to the New York State Department of Environmental Conservation, Division of Lands and Forests, for implementation of the planned forestry treatment.

The New York State Department of Environmental Conservation, Division of Lands and Forests, will:

In cooperation with the Forest Service, furnish technical assistance to landowners and others for the determination of needed practices and installation of forest treatment measures.

The forest land treatment measures will be installed by the landowners with technical assistance furnished by the New York State Department of Environmental Conservation, Division of Lands and Forests in cooperation with the U.S. Forest Service.

Land treatment measures will be operated and maintained by the landowners and operators. Technical assistance will be provided by the Broome County Soil and Water Conservation District, the Delaware County Soil and Water Conservation District, and the New York State Department of Environmental Conservation (Division of Lands and Forests), subject to availability of resources.

Broome County will operate and maintain all structural measures. Annual operation and maintenance cost for the structural measures is estimated to be \$2,200.

The county will utilize their existing labor and equipment resources or will furnish funds through regular appropriations to accomplish necessary operation and maintenance activities. Operation and maintenance to be performed by the county includes, but is not limited to mowing the vegetated areas, removing debris from the structures, keeping Bone Creek channel from the floodwater retarding structure downstream to the confluence with Oquaga Creek in good repair, and repairing dikes. Maintenance activities will be timed to minimize damage to wildlife. Mowing of vegetated areas will be scheduled to follow the spring nesting period of ground nesting birds and mammals. Debris removal and channel maintenance will be scheduled to avoid spring and fall spawning periods.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for three years following installation of the structures. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of three years is provided for all structural works of improvement and associated vegetative cover. During this period the Soil Conservation Service may use P.L. 566 funds to cost share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as for the original structure.

There is no storage specifically provided for recreational use. Adequate provisions will be made to exclude the public to prevent

the creation of unsanitary conditions. If public use is allowed in the future, the Sponsors will provide adequate sanitary facilities to serve the use contemplated.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work and work resulting from improper operation and maintenance. However, the Soil Conservation Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement, between the Soil Conservation Service and the County of Broome, will be executed for each structure prior to the signing of a project agreement. It will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance. The agreement will contain a reference to the SCS State Watersheds Operation and Maintenance Handbook. An operation and maintenance plan will be prepared for each structure in accordance with guidelines contained in the Handbook.

AGREEMENT

between the following local organizations:

County of Broome
Delaware County Board of Supervisors
Broome County Soil and Water Conservation District
Delaware County Soil and Water Conservation District

(Referred to herein as sponsors.)

State of New York
and the
Soil Conservation Service
United States Department of Agriculture
(Referred to herein as SCS)

Whereas, application has heretofore been made to the Secretary of Agriculture by local organization(s) for assistance in preparing a plan for works of improvement for the Deposit Watershed, State of New York, under the authority of the Watershed Protection and Flood Prevention Act (16 U.S.C. 1001-1008); and

Whereas, the responsibility for administration of the watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Soil Conservation Service (SCS); and

Whereas, there has been developed through the cooperative efforts of local organizations and SCS this plan for works of improvement for the Deposit Watershed, State of New York;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through the Soil Conservation Service, and the Sponsors hereby agree on this plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provide for in this watershed plan and including the following:

1. The Sponsors will acquire, with other than P.L. 566 funds, such landrights as will be needed in connection with the works of improvement. (Estimated Cost \$75,800.)

2. The Sponsors assure that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsors and SCS as follows:

	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Relocation Payment Costs</u> (dollars)
Relocation Payments	30	70	0 <u>1/</u>

3. The Sponsors will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

4. The percentages of construction costs to be paid by the Sponsors and by SCS are as follows:

<u>Works of Improvement</u>	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Construction Costs</u> (dollars)
All structural measures	0	100	1,034,100

5. The percentages of the engineering costs to be borne by the Sponsors and SCS are as follows:

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost shared in accordance with the percentages shown.

<u>Works of Improvement</u>	<u>Sponsors</u> (percent)	<u>SCS</u> (percent)	<u>Estimated Engineering Costs</u> (dollars)
All structural measures	0	100	135,000
6. The Sponsors and SCS will each bear the costs of Project Administration which it incurs, estimated to be \$19,100 and \$146,000 respectively.			
7. The Sponsors will obtain agreements from owners of not less than 50 percent of the land above each reservoir and flood-water retarding structure that they will carry out conservation farm or ranch plans on their land.			
8. The Sponsors will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the watershed plan.			
9. The Sponsors will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.			
10. The Sponsors will be responsible for the operation, maintenance, and replacement of the works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.			
11. The costs shown in this plan represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.			
12. This agreement is not a fund obligating document. Financial and other assistance to be furnished by SCS in carrying out the plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.			

13. A separate agreement will be entered into between SCS and Sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
14. This plan may be amended, revised, or terminated only by mutual agreement of the parties hereto except that SCS may terminate financial and other assistance in whole, or in part, at any time it determines that the Sponsor has failed to comply with the conditions of this agreement. In this case, SCS shall promptly notify the Sponsor in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the Sponsor or recoveries by SCS under projects terminated shall be in accord with the legal rights and liabilities of the parties.
15. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
16. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR 15.1-15.12), which provide that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.

By _____

Title _____

Address _____ Zip Code _____ Date _____

The signing of this plan was authorized by a resolution of the governing
body of the _____
adopted at a meeting held on _____

Address _____ Zip Code _____

Date _____

By _____

Title _____

Address _____ Zip Code _____ Date _____

The signing of this plan was authorized by a resolution of the governing
body of the _____
adopted at a meeting held on _____

Address _____ Zip Code _____

Date _____

By _____

Title _____

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Address _____ Zip Code _____

Date _____

By _____

Title _____

Address _____ Zip Code _____ Date _____

The signing of this plan was authorized by a resolution of the governing body of the _____
adopted at a meeting held on _____

Address _____ Zip Code _____

Date _____

Appropriate and careful consideration has been given to the environmental impact statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service

United States Department of Agriculture

Approved by:

Robert L. Hilliard
State Conservationist

Date

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST
Deposit Watershed, New York

Installation Cost Item	Unit	No.	Estimated Cost (Dollars) 1/						TOTAL
			SCS 3/	P. L. 566 Funds FS 3/	Total	SCS 3/	FS 3/	Other	
LAND TREATMENT - GOING PROGRAM									
Land Areas 2/	Acres	125			20,000	11,700	20,000	20,000	
Cropland	Acres	575						11,700	11,700
Forest Land	Acres	35,400	"				39,000	39,000	
Fire Protection						5,000	13,200	18,200	18,200
Technical Assistance									
SUBTOTAL					25,000	63,900	88,900	88,900	
LAND TREATMENT - ACCELERATED									
Land Areas 2/	Acres	1,700			340,000	56,400	340,000	340,000	
Cropland	Acres	2,600					56,400	56,400	56,400
Forest Land									
Fire Protection									
Technical Assistance									
SUBTOTAL			75,000	79,100	154,100	40,000	15,000	53,000	207,100
TOTAL LAND TREATMENT			75,000	79,100	154,100	380,000	69,400	449,400	603,500
STRUCTURAL MEASURES									
Construction									
Floodwater Retarding Structures									
Bone Creek		323,000			323,000				323,000
Palmer Pond, Diversion and Waterway		106,700			106,700				106,700
Channel Work 4/									
Bone Creek Channel Repair (M)		162,000			162,000				162,000
Butler-Big Hollow Diversion (O)		394,000			394,000				394,000
Other									
Borden Street Dike		31,200			31,200				31,200
Marsh Creek Dike and Trash Rack		17,200			17,200				17,200
SUBTOTAL Construction		1,034,100			1,034,100				1,034,100
ENGINEERING SERVICES		135,000			135,000				135,000
PROJECT ADMINISTRATION									
Construction Inspection		73,000			73,000	10,000		10,000	83,000
Other		73,000			73,000	9,100		9,100	82,100
SUBTOTAL - Administration		146,000			146,000	19,100		19,100	165,100
Other Costs									
Landrights									
TOTAL STRUCTURAL MEASURES		1,315,100			1,315,100	94,900		75,800	75,800
TOTAL PROJECT		1,390,100	79,100	1,469,200	499,900	133,300	1	94,900	1,416,000
1/ Price base 1976.									
2/ Includes only areas estimated to be adequately treated during the project installation period. Dollar amounts apply to total land areas, not just to adequately treated areas.									
3/ Federal agency responsible for assisting in installation of works of improvement.									
4/ Type of channel prior to project: (M) - mammal ditch or previously modified channel;									
(O) - none or practically no defined channel.									

1/ Price base 1976.
2/ Includes only areas estimated to be adequately treated during the project installation period. Dollar amounts apply to total land areas, not just to adequately treated areas.
3/ Federal agency responsible for assisting in installation of works of improvement.
4/ Type of channel prior to project: (M) - mammal ditch or previously modified channel;
(O) - none or practically no defined channel.

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TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT
Deposit Watershed, New York
(Total Watershed)

Measures	Unit	Applied to Date	Total Cost (Dollars)1/
LAND TREATMENT			
Soil Conservation Service			
Access Road	Ft.	2,000	7,000
Conservation Cropping System	Ac.	410	28,700
Critical Area Planting	Ac.	18	5,040
Diversions	Ft.	31,359	27,439
Field Border	Ft.	14,960	525
Fish Pond Management	No.	15	265
Grass Waterway or Outlet	Ac.	3	2,100
Livestock Exclusion	Ac.	289	17,195
Mulching	Ac.	18	1,575
Pasture & Hayland Management	Ac.	628	13,200
Pasture & Hayland Planting	Ac.	765	53,550
Pond	No.	27	47,250
Tile	Ft.	17,463	12,224
Recreation Trail & Walkway	Ft.	2,000	1,400
Streambank Protection	Ft.	18,627	32,597
Stripcropping	Ac.	219	16,863
Wildlife Upland Habitat Management	Ac.	315	16,250
Land Adequately Treated	Ac.	2,825	324,950
SCS Subtotal			608,123
LAND TREATMENT			
Forest Service			
Accomplishments During Past Ten Years			
Forest Resource Protection & Management			
Forest Fire Control	Ac.	35,400	77,800
Multiple Use Management	Ac.	5,056	360
Forest Resource Improvement			
Tree Planting	Ac.	400	24,000
Stand Improvement	Ac.	550	22,000
Woodland Grazing Control (Two Miles of Protection)	Ac.	400	1,400
FS Subtotal			125,560
TOTAL			733,683

1/ Total Cost: Includes technical assistance costs and installation costs based on the 1975 dollar.

TABLE 2 - ESTIMATED COST DISTRIBUTION

Deposit Watershed New York
(Dollars) 1/

		Installation Cost P.L.		566 Funds		Installation Cost - Other Funds		
		Construction	Engineering	Total P.L.	566	Land Rights	Total Other	Total Installation Cost
STRUCTURAL MEASURES								
Floodwater Retarding Structures:								
Bone Creek	323,000	42,000		365,000	20,600 ^{2/}		20,600	385,600
Palmer Pond, Diversion and Waterway	106,700	17,000		123,700	4,100		4,100	127,800
Channel Work:								
Bone Creek Channel Repair (M) ^{2/}	162,000	16,000		178,000	30,000		30,000	208,000
Butler ^{3/} and Big Hollow Diversion (O)	394,000	51,300		445,300	19,500		19,500	464,800
Other:								
Borden Street Dike	31,200	5,600		36,800	1,400		1,400	38,200
Marsh Creek Dike and Trash Rack	17,200	3,100		20,300	200		200	20,500
SUBTOTAL - Structural	1,034,100	135,000		1,169,100	75,800		75,800	1,244,900
PROJECT ADMINISTRATION				146,000			19,100	165,100
GRAND TOTAL				1,315,100			94,900	1,410,000

1/ Price base 19772/ Includes \$17,699 for road relocation.3/ Type of channel before project: (M) - manmade ditch or previously modified channel;
(O) - none or practically no defined channel.

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TABLE 3 - STRUCTURAL DATA
DAMS WITH PLANNED STORAGE CAPACITY
Deposit Watershed, New York

Item	Unit	Bone	Palmer	Total
Class of Structure		C	C	
Drainage Area	Sq. Mi.	1.27	.2	
Runoff Curve No.		72	73	1.47
Elevation Top of Dam	Ft.	1,245	1,152	
Elevation Crest Emergency Spillway	Ft.	1,239	1,147	
Elevation Crest Inlet	Ft.	1,235	1141.2	
Maximum Height of Dam	Ft.	66	28	
Volume of Fill	Cu. Yd.	92,000	15,000	107,000
Total Capacity				
Sediment Submerged	Ac. Ft.	23.3	3.2	26.5
Sediment Aerated	Ac. Ft.	4.2	.3	4.5
Floodwater Retarding	Ac. Ft.	34.5	32	66.5
Surface Area				
Sediment Pool	Acres	2	3	5
Floodwater Retarding Pool ^{1/}	Acres	3	7	10
Principal Spillway Design				
Runoff Volume (1-day)	In.	3.4	3.4	
Runoff Volume (10-day)	In.	8.6	8.6	
Capacity (Max.)	cfs	445	5	
Dimensions of Conduit	Ft./In.	48	0.5x1.0	
Emergency Spillway Design				
Frequency Operation-Emergency Spillway	% chance	1	1	
Rainfall Volume (ESH)	In.	9.7	9.7	
Runoff Volume (ESH)	In.	6.2	6.4	
Storm Duration	Hrs.	6	6	
Bottom Width	Ft.	200	50	
Velocity of Flow (V _e)	Ft. Sec.	8.4	7.1	
Slope of Exit Channel	Ft./Ft.	.026	.029	
Max. Reservoir Water Surface Elevation	Ft.	1,242	1,149	
Freeboard Design				
Rainfall Volume (FH)	In.	23.5	23.5	
Runoff Volume (FH)	In.	19.4	19.6	
Storm Duration	Hrs.	6	6	
Max. Reservoir Water Surface Elevation	Ft.	1,245	1,152	
Capacity Equivalents				
Sediment Volume	In.	.40	.32	
Floodwater Retarding Volume	In.	.51	3.0	

1/ Crest of Emergency Spillway

TABLE 3B - STRUCTURAL DATA
CHANNEL WORK

Deposit Watershed, New York

Channel Name Reach	Length	Drainage Area sq.mi.	(100) yr. Frequency Design Discharge cfs	1/ Channel Dimensions		Side Slopes	"n" Value As Built ft/sec	Velocities ft/sec	Excavation Volume cu.yds.	1/ Type of Work	2/ Existing Channel Type	3/ Present Flow Condi.
				Bottom Gradient ft/ft	Width ft							
Bone Creek Channel Repair	1,300	1.51	720	.037	Varies	Vertical	.012	.012	20	-	V	M(1940)
Butler-Big Hollow Diversion	700	8.27	3,500	.0035	22	Vertical	.012	.012	28	8,400	I	0
Diversion to Palmer Pond	1,600	.07	129	.01	Varies	3:1	.035	.025	Varies	-	I	0
Rocklined Open Channel Below Wheeler Street	270	.2	30	.05	2	2:1	.035	.035	7	-	II	M(1940)
											I	

1/ I - Establishment of new channel including necessary stabilization measures.
II - Enlargement or realignment of existing channel or stream.

III - Cleaning out natural or manmade channel (includes bar removal and major clearing and snagging operation).

IV - Clearing and removal of loose debris within channel section.

V - Stabilization as primary purpose (by continuous treatment or localized problem areas--present capacity adequate).

2/ N - An unmodified, well defined natural channel or stream.
M - () - Mammade ditch or previously modified channel (show approximate date of original major construction in parenthesis).

O - None or practically no defined channel.

3/ Pr - Perennial - flows at all times except during extreme drought.

I - Intermittent - continuous flow through some seasons of the year but little or no flow through other seasons.

E - Ephemeral - flows only during periods of surface runoff, otherwise dry.

S - Ponded water with no noticeable flow - caused by lack of outlet or high groundwater table.

NOTE: A subscript "L" should be added to the Roman numeral classification to indicate an impervious lining.

September 1977

TABLE 3C - STRUCTURAL DATA

DIKES

Deposit Watershed, New York

Name	Length (ft.)	Height (ft.)	Top Width (ft.)	Side Slopes	Volume (cu.yds.)
Marsh Creek	500	5	10	3:1	2,100
Borden Street	1,800	4	10	3:1	5,900
Elm Street to Beebe Hill Road	4,000	8	10	3:1	13,100
Elm Street to School	400	6	10	3:1	1,400

September 1977

TABLE 4 - ANNUAL COST

Deposit Watershed, New York
1/
(Dollars)

Evaluation Unit	Amortization of Installation Cost 2/	Operation, Maintenance and Replacement Cost	Total
Unit #1 Village of Deposit	78,210	2,000	80,210
Unit #2 Marsh Creek	1,300	200	1,500
Project Ad- ministration	10,550	:::::	10,550
GRAND TOTAL	90,060	2,200	92,260

1/ Price base: 1977

2/ Amortized @ 6-3/8 percent interest rate for 100 years

September 1977

TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Deposit Watershed, New York
(Dollars) 1/

Item	Estimated Average Annual Damage		Damage Reduction Benefit ^{2/}
	Without Project	With Project	
Floodwater			
Other Agricultural	1,100	50	1,050
Urban	55,025	820	54,205
Road, Bridge, and Structure	17,525	780	16,745
Subtotal	73,650	1,650	72,000
Sediment			
Channel Cleanout	2,740	1,370	1,370
Subtotal	2,740	1,370	1,370
Indirect	7,440	550	6,890
Total	83,830	3,570	80,260

1/ Price base 1977

2/ Monetary effects of accelerated land treatment measures were not evaluated.

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS
 Deposit Watershed, New York
 (Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS ^{1/}			Benefit Cost Ratio	
	Damage ^{2/} Reduction	Changed Land Use			
		Urban	Employment		
UNIT No. 1 Village of Deposit	76,760	9,325	9,680	95,765 / 80,210 = 1.2:1	
UNIT No. 2 Marsh Creek	3,500		220	3,720 / 1,500 = 2.5:1	
Project Administration				10,550	
GRAND TOTAL	80,260	9,325	9,900	99,485 / 92,260 = 1.1:1	

^{1/} Price base 1977^{2/} From Table 5^{3/} From Table 4

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ENVIRONMENTAL IMPACT STATEMENT

DEPOSIT WATERSHED

Broome, Chenango, and Delaware Counties, New York

September 1977

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DEPOSIT WATERSHED
BROOME, CHENANGO, AND DELAWARE COUNTIES, NEW YORK

FINAL ENVIRONMENTAL IMPACT STATEMENT

Robert L. Hilliard
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations

Village of Deposit
Deposit, New York 13754

County of Broome
County Office Building, Binghamton, New York 13902

Delaware County Board of Supervisors
Court House, Delhi, New York 13753

Broome County Soil and Water Conservation District
840 Front Street, Binghamton, New York 13905

Delaware County Soil and Conservation District
139 Stockton Avenue, Walton, New York 13856

September 1977

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service
U.S. Courthouse and Federal Building, Room 771
100 South Clinton Street
Syracuse, New York 13202

USDA ENVIRONMENTAL IMPACT STATEMENT

Deposit Watershed Project
Broome, Chenango, and Delaware Counties

New York

Prepared in Accordance With
Sec. 102(2)(C) of P.L. 91-190

SUMMARY

- I Draft
- II Soil Conservation Service
- III Administrative
- IV Description of project purpose and action.

A project for watershed protection and flood prevention in Broome, Chenango, and Delaware Counties, New York, to be implemented under authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83d Congress, 68 Stat. 666), as amended. The planned works of improvement include conservation land treatment, supplemented by two floodwater retarding structures, channel work, and dikes in residential and agricultural areas.

Summary of impacts.

Installation of land treatment measures will reduce erosion rates on 1,825 acres of cropland from an average of 5.3 tons per acre to 3.0 tons per acre, reduce sediment delivered to the mouth of the watershed by 1,049 tons annually, and increase efficiencies of production. Installation of structural measures will reduce floodwater damages in the village of Deposit by 98 percent and all identified flood damages by 96 percent from floods up to the magnitude of the 100-year frequency event throughout the life of the project. This will benefit directly about 640 residents, owners and operators, and employees of 32 businesses. Installation of the structures will result in the commitment of 1 acre of cropland, 4 acres of pasture, 18 acres of open land formerly cropped, 3 acres of forest land, 2 acres of urban land, 3 acres of water, 2 acres of other land; and 900 feet of intermittent stream, temporary construction inconveniences; short term increases in sediment and turbidity.

Decrease wildlife population as a result of direct loss during construction and elimination of 1 acre of urban habitat. Alter wildlife densities and composition by converting 2 acres of farmstead, 1 acre urban, 10 acres openland formerly cropped, 1 acre cropland, 4 acres pasture, and 2 acres forest to 17 acres grass and 2 acres of water; and by temporarily flooding 8 acres of openland formerly cropped and 1 acre of forest.

VI List of alternatives

1. Land treatment.
2. Land treatment, four floodwater retarding structures.
3. Land treatment, debris basin, on floodwater retarding structure, and two channels.
4. Land treatment, three floodwater retarding structures and two channels.
5. Land treatment, trout stream improvement.
6. No project.

VII Comments were requested but no response was received during the review of the draft Environmental Impact Statement from the following agencies:

Department of Commerce
Department of Transportation
Federal Power Commission
Appalachian Regional Commission
New York State Office of Planning Services
Southern Tier East Regional Planning and Development Board
National Audubon Society
Natural Resources Defense Council
International Joint Committee
Friends of the Earth
Environmental Defense Fund
National Wildlife Federation
Water Resources Council
Broome County Planning Board
Delaware County Planning Board

Comments were received from the following agencies:

Department of the Army
Department of Health, Education, and Welfare
Department of the Interior
Office of Equal Opportunity - USDA
Environmental Protection Agency
Advisory Council on Historic Preservation
Delaware River Basin Commission
New York State Department of Environmental Conservation
Broome County Environmental Review Committee
New York State Department of Agriculture and Markets
Broome County Historical Society
Broome County Environmental Management Council

VIII Draft statement transmitted to CEQ on June 3, 1977

USDA SOIL CONSERVATION SERVICE
FINAL ENVIRONMENTAL IMPACT STATEMENT ^{1/}

for

Deposit Watershed, Broome, Chenango, and Delaware Counties, New York

AUTHORITY

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Village of Deposit
County of Broome
Delaware County Board of Supervisors
Broome County Soil and Water Conservation District
Delaware County Soil and Water Conservation District

PROJECT PURPOSES AND GOALS

The Sponsors are aware of society's concern and emphasis for enhancement of the natural resources as a source of present enjoyment and a heritage for future generations. Therefore, the project objective is to enhance environmental quality by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

^{1/} All information and data, except as otherwise noted, were collected by the Soil Conservation Service and Forest Service, U. S. Department of Agriculture.

The following goals are outlined as initially agreed to between the Sponsoring Local Organizations and the Service and subsequently refined during project formulation. The Sponsors recognize that competing or conflicting uses of the same areas may occur in meeting the stated goals and that the planned project may not provide for all of these following stated goals:

1. Reduce floodwater damages in the village of Deposit and surrounding watershed areas.
2. Reduce erosion occurring throughout the watershed.
3. Enhance existing quality and quantity of stream fishery.
4. Reduce floodproofing costs to future development areas.

PLANNED PROJECT

LAND TREATMENT MEASURES

The land treatment phase of the plan includes technical assistance and measure installation. The land treatment phase includes continuation of the ongoing technical assistance and measure installation at a rate in existence prior to the formulation of this plan and accelerated technical assistance and measure installation required to meet project objectives. Technical assistance, going and accelerated, will be used to review, revise, and update existing conservation and forest management plans, to develop new plans where needed, for soil surveys, resource inventories and for installation of measures. Technical assistance will thus be applicable to any acre in the watershed. Measure installation will be on those acres which require treatment for adequate protection and for changes in use.

Through consensus of the conservation districts, community leaders, landowners, and state and federal agencies, it was agreed that adequate land treatment or protection should be applied during the 5-year installation period to 1,825 acres of cropland, to include conservation cropping system, crop residue use, subsurface drain, contour farming, agricultural waste management system, disposal lagoon, minimum tillage, diversion, mulching, grassed waterway or outlet, holding tank, and stripcropping; and 3,175 acres of forest, to include tree planting, controlled harvest cut, supervised stand improvement, woodland grazing control-fencing, and erosion control-log road and skid trail. Definitions for land treatment measures are given in Appendix F.

Wildlife habitat management practices will be interspersed throughout the watershed. These practices will include planting grasses, legumes, and shrubs; constructing watering facilities; and managing valuable wildlife food plants.

STRUCTURAL MEASURES

Planned structural measures include two floodwater retarding structures, two channels, and two dikes. The two floodwater retarding structures will control 1.47 square miles of drainage area which is approximately

2 percent of the total watershed area. The design life for all structural measures is 100 years. Location of the structural measures is shown on the Project Measures Map, Appendix D.

FLOODWATER RETARDING STRUCTURES

The Bone Creek floodwater retarding structure, with a drainage area of 1.27 square miles, will be located on Bone Creek above the village of Deposit and just west of Allen Street. The structure will be a 66-foot high earthfill dam with a single stage reinforced concrete drop inlet principal spillway with an energy dissipater and a vegetated earth emergency spillway. It will provide capacity for a total of 23.3 acre-feet of submerged sediment, and 34.5 acre-feet of floodwater storage. The floodwater detention storage will empty in less than one day. (See Table 3 for Structural Data.)

Flow will be controlled through an ungated reinforced concrete conduit, which incorporates a single-stage principal spillway system that controls runoff resulting from storms up to the 100-year frequency flood event. Flow resulting from storms greater than the 100-year frequency event will be routed safely around the dam through the emergency spillway. (See Appendix D, Typical Cross Section of Floodwater Retarding Structure.)

The foundation for the structure is glacial till and stable bedrock. The emergency spillway is located on the right abutment and was designed to permit a velocity of 8.4 feet per second through the spillway during passage of the peak of the emergency spillway design storm. The material excavated from the emergency spillway is glacial till (GM) (20) and is suitable for use as earthfill for the dam. Additional earthfill (glacial till) for the dam is available on the right abutment.

The foundation has no critical earthquake hazards (7). The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area required will include 3 acres for the temporary floodpool, 2 acres for sediment storage, 3 acres for the embankment, emergency spillway, outlet channel and access areas, and 2 acres for the borrow area. For inventories of present land use see Table C, and future land use and land use changes, see Table N.

The sediment pool surface area will be approximately 2 acres and have a maximum initial depth of 45 feet. This area will gradually decrease as sediment accumulates over the life of the project. The floodpool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetation establishment period.



FIGURE 1 - TYPICAL FLOODWATER RETARDING STRUCTURE

The Palmer Pond floodwater retarding structure, with a drainage area of 0.2 square mile, is located just west of Pine Street.

The structure will be a 28-foot high earthfill dam with a reinforced concrete drop spillway and vegetated earth emergency spillway.

It will provide capacity for a total of 3.2 acre-feet of submerged sediment, and 32 acre-feet of floodwater storage. The floodwater detention storage will empty in less than 3 days.

A diversion 1,600 feet long will divert flow from 47 acres into the pond. About 270 feet of rock riprap channel to be installed downstream below Wheeler Street will carry water to Big Hollow Creek.

Flow from the pond will be controlled through an orifice in the reinforced concrete drop spillway. The spillway will safely handle runoff events resulting from storms up to the 100-year frequency flood event.

The foundation for the structure is glacial till. The emergency spillway is located on the left abutment and was designed to permit a velocity of 7.1 feet per second through the emergency spillway during passage of the peak of the emergency spillway design storm. The material excavated from the emergency spillway is glacial till (GM) (20) and is suitable for use as earthfill for the dam. Additional earthfill (glacial till) for the dam is available on the right abutment.

The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards of the structure.

Minimum land area will include 7 acres for the temporary floodpool 3 acres for sediment storage, 3 acres for the embankment, emergency spillway, outlet channel and access areas, and 3 acres for the borrow area. For inventories of present land use see Table C, and for future land use and land use changes, see Table N.

The sediment pool surface area will be approximately 3 acres and have a maximum initial depth of about 3 feet. This area will gradually decrease as sediment accumulates over the life of the project. The floodpool area will be subject to short term temporary flooding and will experience normal vegetation successional trends over the life of the project. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetation establishment period.

CHANNEL WORK

The Bone Creek channel repair requires about 1,300 feet of channel rehabilitation through the village of Deposit from just above Allen Street, to just below Front Street. The work consists of the removal and replacement of deteriorated concrete walls, removal of trees that are putting pressure on the existing walls, and replacement of concrete eroded from the channel floor.

Landrights required for the channel repair will include permanent access easements. Disturbances to backyards of homes will be limited to areas adjacent to the existing channel.

The Elm Street diversion consists of about 4,400 feet of dikes, an inlet structure (straight inlet), about 700 feet of reinforced concrete channel, and an energy dissipating device before discharging diverted Butler Brook-Big Hollow Creek waters into the Delaware River. The dikes will have a top width of 10 feet and the side slopes will be 3 feet horizontal to 1 foot vertical (3:1). The straight inlet will be a reinforced concrete structure with an antiseep collar and 2 wing walls. The overall length will be about 55 feet, the width 22 feet, and the height 11 feet. The inlet will contain an 18-inch diameter conduit to allow low flows to continue down Butler Brook. The diversion will be designed to handle all flow above the minimum channel capacity.

The reinforced concrete channel will be 8 feet deep and 22 feet wide. The energy dissipating device will be a reinforced concrete sill or "flip bucket" type energy dissipater.

The flow of Big Hollow and Butler Brook will be guided by the dikes into the inlet structure just above Elm Street and then diverted into the channel to the Delaware River. Backwater effects of the Delaware River were considered in evaluating channel capacities.

Investigations indicate that the glacial till and outwash soils in the area are suitable for the dikes and the outwash deposits in the channel area appear to be sufficiently coarse and of sufficient depth to withstand loading from the proposed inlet and channel and therefore differential settlement and/or consolidation should not be a problem.

Minimum land area required will include 4 acres of pasture for the dikes and borrow areas and 2 acres of urban land for the diversion

channel. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetative establishment period. The reinforced concrete diversion channel and inlet will have a permanent fence installed on top of the walls for safety. Construction will require the replacement of a bridge at Elm Street and a new bridge at Route 10.

OTHER

The Borden Street dike will consist of about 1,800 feet of earthen dike with a top width of 10 feet and an average height of about 4 feet and the Marsh Creek dike and trash rack will consist of about 500 feet of earthen dike with a top width of 10 feet and an average height of about 5 feet.

Side slopes for Borden Street and Marsh Creek dikes will be 3 feet horizontal to 1 foot vertical.

Minimum land area required will include 4 acres for the Borden Street dike and 2 acres for the Marsh Creek dike and trash rack. The access road and temporary construction area will be used intensively over the installation period, and all disturbed areas will then be seeded to desirable grasses and legumes. Public access to these areas will be discouraged by fencing to prevent damage during the vegetation establishment period.

Each contract will require that contractors adhere to strict specifications for minimizing soil erosion, water, noise, and air pollution during construction. The specifications will include provisions for measures, such as sediment basins and temporary vegetation and mulching, to protect exposed areas until permanent vegetation is established. Adherence to state and local health requirements will be required regarding disease vector control, noise, and air pollution. Suppressors will be used to keep dust within tolerable limits. Pollution of surface areas or ground water by chemicals, fuel, lubricants, sewage, and other pollutants will not be permitted. Clearing and disposal of brush and vegetation will be carried out in accordance with the New York Forest Practice Act and applicable state and local laws.

There is no storage specifically provided for recreational use. Adequate provisions will be made to exclude the public to prevent the creation of unsanitary conditions from concentrations of litter and human waste. If public use is allowed in the future, the Sponsors will provide adequate sanitary facilities to serve the use contemplated.

Requirements for safety and health, in conformance with the Federal Construction Safety Act of 1969 (P.L. 91-54), will be included in each construction contract. Design and construction will comply with applicable state laws. The plan has been coordinated with the Division of Historic Preservation, New York State Parks and Recreation. Investigations to date indicate that the project will not encroach on any historic place or any places planned for historic preservation. If artifacts or other items of archeological or historic significance are uncovered by the Soil Conservation Service, or brought to its attention by others prior to or during construction, the State Commission of Parks and Recreation and the National Park Service will be notified. Construction will not begin or continue until appropriate arrangements for survey or salvage have been made.

OPERATION AND MAINTENANCE

Land treatment measures will be operated and maintained by the land owners and operators. Technical assistance will be provided by the Broome County Soil and Water Conservation District, the Delaware County Soil and Water Conservation District, and the New York State Department of Environmental Conservation (Division of Lands and Forests), subject to availability of resources.

Broome County will operate and maintain all structural measures. Annual operation and maintenance cost for the structural measures is estimated to be \$2,200.

The county will utilize their existing labor and equipment resource or will furnish funds through regular appropriations to accomplish necessary operation and maintenance activities. Operation and maintenance to be performed by the county includes, but is not limited to mowing the vegetated areas, removing debris from the structures, keeping Bone Creek channel from the floodwater retarding structure downstream to the confluence with Oquaga Creek in good repair, and repairing dikes. Maintenance activities will be timed to minimize damage to wildlife. Mowing of vegetated areas

will be scheduled to follow the spring nesting period of ground nesting birds and mammals. Debris removal and channel maintenance will be scheduled to avoid spring and fall spawning periods.

The Sponsors and the Soil Conservation Service will make a joint inspection annually, after unusually severe floods, and after the occurrence of any other unusual conditions that might adversely affect the structural measures. They will jointly determine what maintenance measures are needed. These inspections will continue for 3 years following installation of the structures. Inspection after the third year will be made annually by the Sponsors. They will prepare a report and send a copy to the Service.

An establishment period of 3 years is provided for all structural works of improvement and associated vegetative cover.

During this period the Soil Conservation Service may use P.L. 566 funds to cost share on any repairs or other work resulting from unknown conditions or deficiencies. The cost of repairs will be shared in the same ratio as for the original structure.

Repairs or additional work not eligible for P.L. 566 financial assistance include maintenance work and work resulting from improper operation and maintenance. However, the Soil Conservation Service will provide technical assistance that may be needed in performing any of these tasks.

An operation and maintenance agreement, between the Soil Conservation Service and the County of Broome, will be executed for each structure prior to the signing of a project agreement. It will include specific provisions for retention and disposal of property acquired or improved with P.L. 566 financial assistance. The agreement will contain a reference to the Soil Conservation Service State Watershed Operation and Maintenance Handbook. An operation and Maintenance plan will be prepared for each structure in accordance with guidelines contained in the Handbook.

PROJECT COSTS

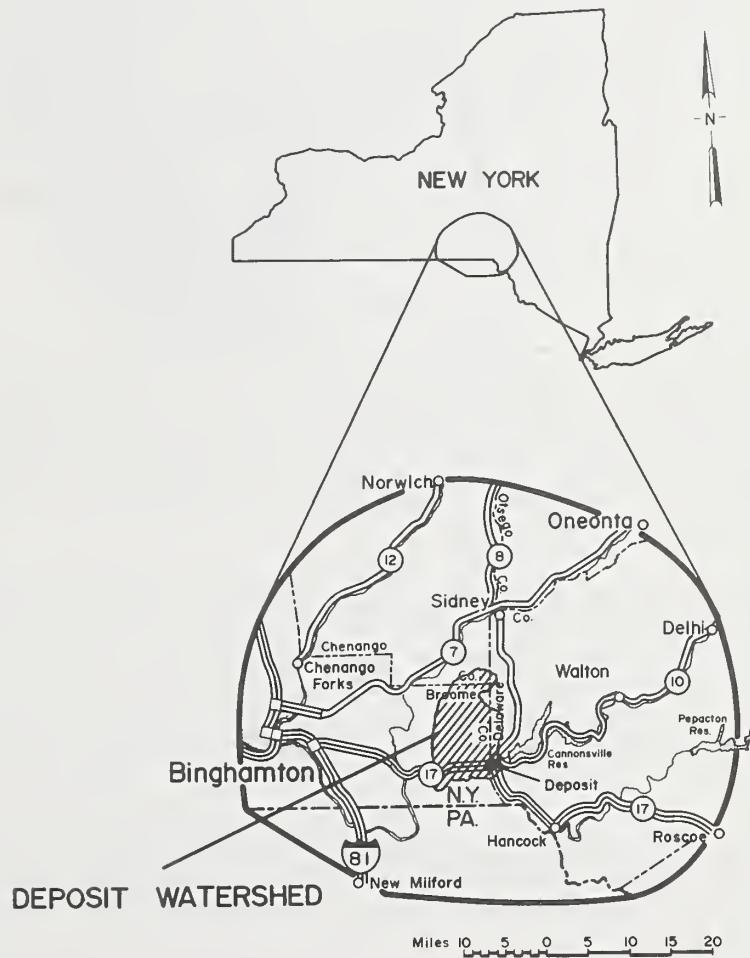
The total installation cost of the works of improvement is estimated to be \$2,102,400. Of this total, \$1,469,200 will be paid by Public Law 566 funds, and \$633,200 by other funds. Total installation cost includes \$692,400 for establishing land treatment measures on private land and \$1,410,000 for structural measures. The estimated construction cost is \$1,034,100. Construction costs will be paid by P.L. 566 funds.

ENVIRONMENTAL SETTING

PHYSICAL RESOURCES

The 48,437-acre Deposit Watershed is located in portions of Broome, Chenango, and Delaware Counties in southeastern New York. There are 43,045 acres, 1,784 acres, and 3,608 acres, respectively in each county. Deposit (population 2,051) is the only village in the watershed. Binghamton (population 64,121) is approximately 30 miles west, and Hancock (population 1,688) is approximately 12 miles southeast of Deposit. See the Watershed Location Map, Figure 2.

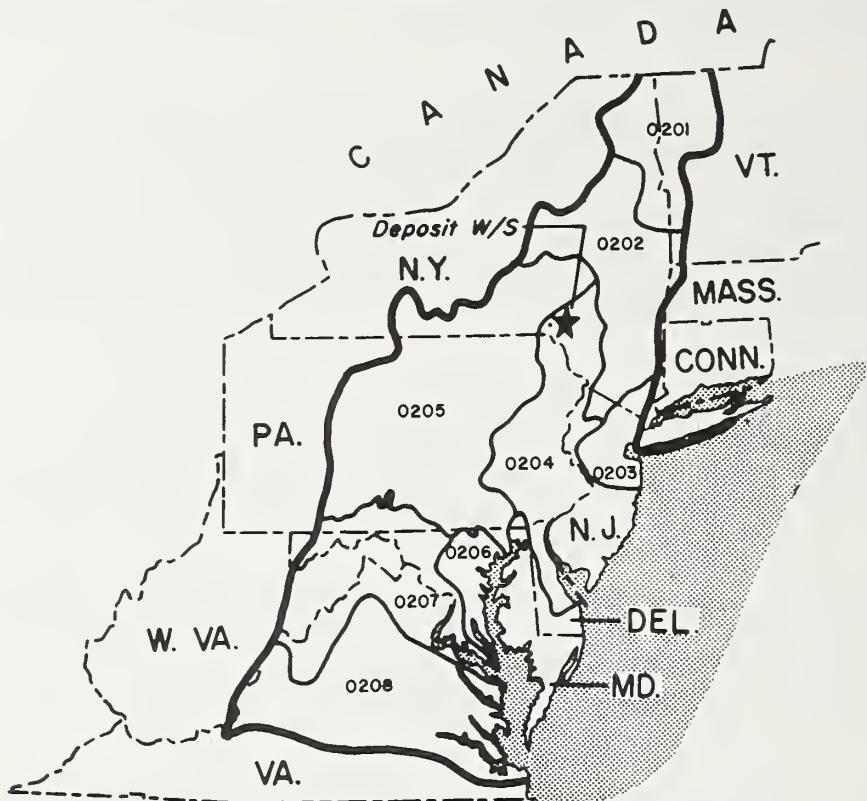
FIGURE 2 -
WATERSHED
LOCATION
MAP



The watershed is located within the Mid-Atlantic Region and Delaware River Basin Subarea (Watershed Resource Region Map, Figure 3), as designated by the Water Resources Council.

FIGURE 3

WATER
RESOURCE
REGION
MAP



Major soil and water resource problems include urban flooding along Bone Creek, Butler-Big Hollow Creek, and Oquaga Creek (near Deposit), agricultural flooding along Oquaga Creek, streambank erosion on all major streams, and need for fish habitat improvement on Oquaga Creek. See Project Map for locations.

The watershed lies in the glaciated Allegheny Plateau and Catskill Mountain Physiographic Provinces (4). The rolling terrain consists of steep upland areas and narrow V-shaped valleys. The exception is Oquaga Creek which flows through a broader U-shaped valley. Elevations range from 2,160 feet mean sea level (m.s.l.) in the upper northeast corner to 975 feet m.s.l. at the confluence of Oquaga Creek with the Delaware River.

Bedrock is of sedimentary origin of the upper Devonian age (8). Rock types include: shale, sandstone, and conglomerate of the Java and West Falls groups, and Sonyea group. Rock outcrops occur in the steep upland section

Glacial deposits are all of Wisconsin age and are primarily till and outwash deposits. Upland soils are principally of the Oquaga-Lackawanna, Volusia-Mardin, and Lordstown-Volusia-Mardin Associations (29). These soils have developed on acidic glacial till containing siltstone, shale, and sandstone. A small area in the upland contains soils of the Collamer-Dunkirk Association. These soils are developed on lacustrine or lake-laid materials.

Flood plain soils include the Chenango-Tioga and Tunkhannock-Barbour Associations. Both soils have developed on recent alluvium overlying gravelly glacial outwash.

Soils in the watershed have been grouped by land use into capability subclasses (Table C - Present Land Use). Land capability classification (18) is a system by which soils are grouped together by classes and subclasses, based on their limitations and hazards for agricultural use. Capability classes are designated by Roman numerals with limitations in use becoming progressively greater from Class I through Class VII. Capability subclasses are a grouping of units having similar kinds of limitations and hazards. Four general kinds of limitations or hazards are recognized: (1) "e", erosion; (2) "w", wetness; (3) "s", rooting zone limitations; and (4) "c", climate.

TABLE C - PRESENT LAND USE

Land Use 1/	I Acres	IIe Acres	IIw Acres	IIs Acres	IIIe Acres	IIIf Acres	IVe Acres	IVw Acres	Vw Acres	Dis- turbed Areas	Vle Acres	Water Acres	Vls Acres	Total
Cropland - Adequately Protected	167	445	355	33	1,302	878	233	76	0	0	0	0	0	3,487
Cropland - Needing Protection	0	0	0	0	1,053	673	431	92	184	0	0	0	0	2,433
Pasture	28	174	100	0	1,655	1,028	1,106	136	177	0	8	0	0	4,412
Open Land Formerly Cropped	8	50	51	0	698	556	170	34	19	0	0	0	0	1,586
Forest Land - Brush	41	105	80	0	1,119	1,003	1,121	109	114	0	397	0	331	4,420
Forest Land - Plantation	0	44	8	6	336	402	151	22	10	0	50	0	51	1,080
Forest Land	158	776	231	187	5,245	4,314	5,666	427	361	0	3,135	0	9,400	29,900
Urban Land	128	0	62	0	28	19	38	0	0	84	10	0	0	369
Water	0	0	0	0	0	0	0	0	0	0	219	0	0	219
Other Land	0	11	7	0	94	54	54	0	48	236	15	0	10	531
TOTAL	530	1,605	892	226	11,530	8,927	8,970	896	915	322	3,615	219	9,792	48,437

1/ Cropland - Land which is used for row crop, close-grown field crops, fallow, rotation hay and pasture, and hayland.
Adequately Protected - Land on which the soil, water, and related plant resources are adequately protected from deterioration, either naturally or by action of the land user.

Needing Protection - Erosion exceeds allowable soil losses.

Pasture - Land producing forage plants to be grazed by livestock. Includes Type 2 wetlands.

Open Land Formerly Cropped - Land which formerly had grown agricultural crops but is now undergoing natural plant succession.

Forest Land - Land at least 10 percent stocked or formerly stocked by forest trees and noncommercial trees.

Forest Land - Brush - Land formerly cropped or formerly pastured that is undergoing succession to trees. Includes Type 6 wetlands.

Forest Land - Plantation - Trees mostly under 25 years of age, composed of various species of pine, spruce, and larch.

Urban Land - Built-up areas, industrial and commercial sites, etc.

Other Land - Includes farmstead, farm roads, fieldlots, ditch banks, fences, hedgerows, wetlands, and recreation areas.

Water - Includes Types 3, 4, and 5 wetlands.

Deposit Watershed is in the eastern plateau climatic division which is classified humid continental (10). Mean annual precipitation is about 38 inches, with the 150-day growing season precipitation being 21 inches (5). Mean annual temperature is 46 degrees Fahrenheit (extremes having ranged from -28 degrees F. to 98 degrees F.), with a mean growing season temperature of 63 degrees F. Mean annual snowfall is 55 inches.

The principal ground water aquifers are bedrock and stratified sands and gravels (26). Yields of more than 100 gallons per minute are common from wells in the stratified deposits which occupy the stream valleys. Yields from bedrock wells can be as high as 550 gal/min, although most are less than 50 gal/min. Yields from dug wells in glacial till are generally a few gallons per day.

The ground water from bedrock and stratified deposits is usually soft, contains moderate to high concentrations of iron, and is

TABLE D - WATERSHED STREAM DESCRIPTION

Reach	Stream	Location	Length(mi)	Channel	Flow Condition	Water Quality ^{1/} Classification	Average Width(ft)	Maximum Depth(in)	Bed Material
1	Bone Creek	Source to Allen St.	1.5	Natural	Intermittent	C	10	12	Gravel & Bedrock
4A	Bone Creek	Allen St. to Outlet	0.5	Previously Modified	Intermittent	D			Concrete
2	Big Hollow Creek	Source to Water Supply Dam	5.5	Natural	Perennial	A	10	18	Gravel Rubble
		Water Supply Dam to Palmer Pond Outlet	1.0	Natural	Perennial	B	12	16	Gravel Rubble
		Palmer Pond Outlet to Mouth	0.5	Natural	Perennial	C	10	18	Gravel Rubble
3	Butler Brook	Source to Junction of Big Hollow Creek	4.0	Natural	Intermittent	C	9	6	Gravel & Bedrock
		Junction of Big Hollow Brook to Mouth	1.0	Natural	Perennial	C	10	24	Silt
4 & S	Oquaga Creek (Lower)	Mouth to McClue	5.0	Natural	Perennial	C	50	48+	Gravel Rubble
7	Oquaga Creek (Middle)	McClue to Sanford	4.0	Natural	Perennial	C	35	48+	Gravel Rubble & Silt
10	Oquaga Creek (Upper)	Sanford to Source	10.0	Natural	Perennial	C	16	48+	Gravel Rubble & Silt
6 & 6A	Fly Creek	Mouth to Source	12	Natural	Perennial	B	12	30	Gravel Rubble
8	Marsh Creek	Mouth to Source	12	Natural	Intermittent	C	10	12	Rubble & Bedrock
9	Tributary from Beaver Pond to Sanford	Mouth to Source	6	Natural	Perennial	C	7	6	Silt & Rubble
	Page Pond Brook	Mouth to Source	3	Natural	Perennial	C	10	24	Gravel Rubble
	Ory Brook	Mouth to Source	3	Natural	Intermittent	C	9	6	Gravel Rubble
	Tributary 21	Mouth to Source	4	Natural	Perennial	C	9	24	Gravel Rubble
	Tarbell Brook	Mouth to Source	3	Natural	Intermittant	C	10	10	Gravel Rubble

1/ Classification and standards governing the Quality and Purity of Waters of New York State (Parts 700-703, Title 6, Official Compilation of Codes, Rules and Regulations), New York State Department of Environmental Conservation, Albany, New York.

Definitions of water quality classifications for best usage are as follows:

Class A: Source of water supply for drinking (if subjected to appropriate treatment), culinary, or food processing purposes, and any other usages.

Class B: Bathing and any other usages except as a source of water supply for drinking, culinary, or food processing purposes.

Class C: Fishing any any other usages except for bathing or as a source of water supply for drinking, culinary, or food processing purposes.

Class D: Agricultural or source of industrial cooling or process water supply and any other usage except for fishing, bathing, or as source of water supply for drinking, culinary, or food processing purposes.

water supply for drinking, culinary, or food processing purposes.

usually low in dissolved solids. The exception is water from shales which frequently contains high concentrations of hydrogen sulfide.

There are no indications that the ground water resources are being depleted. The supply appears capable of considerably greater development, particularly the stratified deposits.

Nonmetallic mineral resources of the area include sand and gravel, stone (slate), and clays. Stone has been quarried in previous years, but active quarrying is no longer being carried on. Sand and gravel is not extensively mined within the watershed, but it is excavated periodically by local landowners and/or contractors.

Stream locations by reach may be found on the watershed Sub-Drainage Map, Figure 4. Physical characteristics and water quality classifications are presented by reach in Table D.

Oquaga Creek, the largest stream in the watershed, flows southerly from its source near the junction of Delaware, Chenango, and Broome Counties, through North Sanford and Sanford, turns eastward at McClure, and joins the West Branch of the Delaware River at Deposit. The upper portion (above North Sanford) has a moderately steep gradient. State and privately owned forests border most of the stream. The gradient flattens and the stream broadens upon reaching the valley bottom at North Sanford. Continuing to Deposit, the stream is bordered with narrow bands of trees and small woodlots as agricultural land uses become prominent. Pasturing in several areas above Sanford has eliminated this cover along the stream. Streambank erosion and bedload deposition also become evident with stream meandering and pasturing. Areas of riprap and willow plantings in the vicinity of McClure attest to previous projects of channel stabilization.

Between the villages of Sanford and North Sanford, Page Pond Brook and Dry Brook enter Oquaga Creek. Reach 9 joins Oquaga Creek at Sanford and Marsh Creek enters Oquaga about a mile north of McClure. Fly Creek enters Oquaga Creek west of McClure as Oquaga Creek's flow changes from southerly to easterly. Tarbell Brook enters Oquaga Creek between Deposit and McClure. These tributaries generally flow through narrow V-shaped valleys and have a moderately steep gradient. Pasture, former cropland, and forests are common adjacent land uses. Flow in these streams is low to intermittent with beaver and manmade ponds encountered frequently.

Bone Creek originates northwest of the village of Deposit and flows southerly into Oquaga Creek below the railroad station. Bone Creek

DEPOSIT WATERSHED

SUB-DRAINAGE AREA MAP

BROOME, DELAWARE AND
CHENANGO COUNTIES, NEW YORK

SOIL CONSERVATION SERVICE 1524

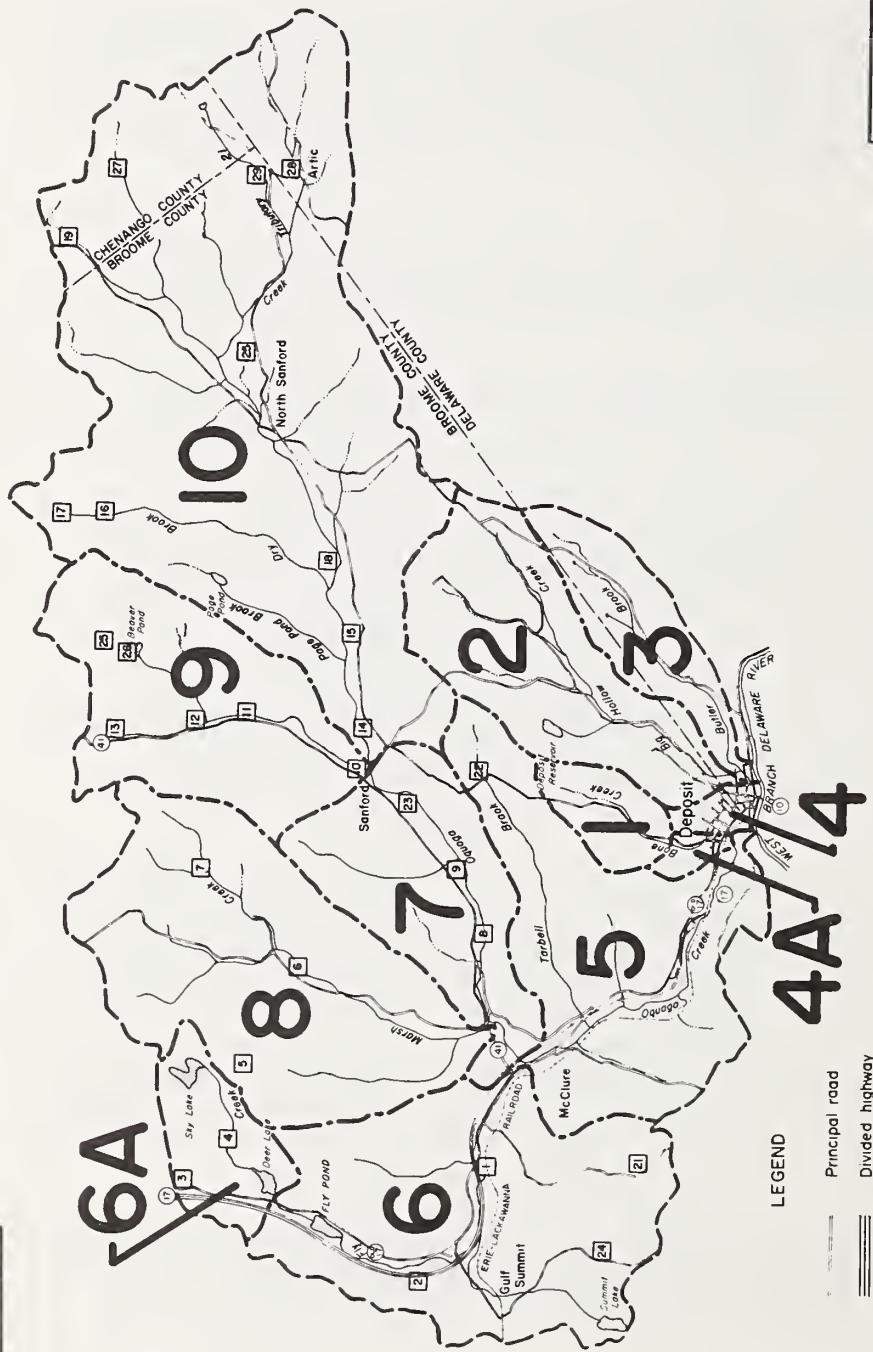


FIGURE 4 - WATERSHED SUB-DRAINAGE MAP

above the village flows on a moderately steep gradient through a forested ravine. Much of the creek through the village is confined in an open concrete channel.

Butler Brook and Big Hollow Creek begin northeast and north of Deposit, respectively, and flow southerly from the forested hills entering a broader agricultural valley above the village. Butler Brook is joined by Big Hollow Creek inside the village limits where the stream becomes confined by adjacent development. The stream outlets into the West Branch of the Delaware River near its confluence with Oquaga Creek.

Two stream gages are located in the watershed. A gage, located on Oquaga Creek in Deposit, in operation since 1940, has recorded a maximum discharge of 7,170 cubic feet per second on July 4, 1970, and a minimum discharge of 0.4 cubic foot per second on November 15, 1964. The second gage, located about 2 miles northeast of North Sanford, in operation for the past 6 years, has recorded a maximum discharge of 218 cubic feet per second on November 9, 1973, and a minimum 0.08 cubic foot per second on October 2, 1969. Water temperatures recorded on the latter gage have ranged from 0 degrees to 21 degrees C. (32 to 70 degrees F.).

Total runoff can be considered to be divided into two parts: storm or direct runoff and base flow. Direct runoff is presumed to consist of overland flow; whereas, base flow comes from lakes or swamps, or from an aquifer replenished by infiltrated rainfall or surface runoff. Seasonal variation of base flow is apparent from the gaged records. Average annual discharge from Oquaga Creek at Deposit is 110 cubic feet per second which is equivalent to 22.5 inches of runoff per year.

One stream gage station, three water quality stations, and eleven water temperature stations were selected to provide water quality base flow data. Water quality samples were taken monthly from spring to late fall of 1975. Temperatures were measured every 2 weeks during essentially the same period. The data collected by the Soil Conservation Service and the results of collected samples are presented in Appendix H.

Wetlands in the watershed were identified as defined by "Wetlands of the United States," Department of the Interior, Fish and Wildlife Service, Circular C-39 1/. Those 1 acre or greater in size are located on Figure 4 and described in Table E.

1/ See Appendix F for a definition of wetland types.

TABLE E- COMPOSITION OF THE WETLANDS IN THE WATERSHED

Location No.	WETLAND TYPES - ACRES					Total Acres
	2	3	4	5	6	
1	0.5	-	-	0.5	-	1
2	-	-	-	1	-	1
3	2	1	-	-	-	3
4	0.5	0.5	-	-	-	1
5	4	-	-	-	-	4
6	2	-	-	-	-	2
7	1	-	1	-	4	6
8	4	-	-	-	-	4
9	1	-	-	-	-	1
10	1	-	-	-	-	1
11	10	2	5	-	18	35
12	0.5	-	-	-	0.5	1
13	2	-	-	-	-	2
14	1	-	-	-	-	1
15	2	-	-	-	-	2
16	-	1	-	5	-	6
17	1.5	0.5	-	-	-	2
18	6	1	-	-	-	7
19	2	-	-	-	-	2
20	-	-	-	0.5	0.5	1
21	2	-	-	-	-	2
22	-	-	-	2	4	6
23	36	-	-	-	-	36
24	-	-	-	10	-	10
25	-	-	-	2	-	2
26	-	-	-	18	2	20
27	-	-	-	2	-	2
28	-	-	2	-	4	6
29	-	-	-	1	-	1
TOTAL	79	6	8	42	33	168

Smaller areas (less than 1 acre) of Type 2 which were not identified are common in pastures and haylands. Hillside seeps are the principal cause of these small Type 2 wetlands. Presently there are 179 acres of land seasonally flooded, classified as Type 1 wetland, in the watershed. Land use of these areas includes 123 acres of cropland, 36 acres of Type 2 wetland, and 20 acres of open land formerly cropped. Approximately 60 acres of wetland not shown in Table E are provided by the 48 lakes and ponds in the watershed. Most of the ponds are less than 1 acre in size.

with depths less than 10 feet. Although emergent vegetation is not often abundant along the shore, these areas are dominantly Type 5 wetlands.

PRESENT AND PROJECTED POPULATION

The Bureau of Economic Analysis (BEA), U.S. Department of Commerce, has delineated the United States into 173 "economic areas." Each area is centered around a city and contains, as closely as possible, those outlying areas whose economies evolve around and are interrelated with that city. Deposit Watershed is included in BEA Economic Area 12, an area which includes eight south-central New York counties and three north-central Pennsylvania counties. (See Figure 5, BEA Map)

The center for Economic Area 12 is the Binghamton, New York-Pennsylvania Standard Metropolitan Statistical Area (SMSA 28) which includes the counties of Broome and Tioga in New York and Susquehanna in Pennsylvania. The SMSA counties have economies which are closely interrelated; whereas, the remaining BEA economic area counties are associated with SMSA because of commuting patterns.

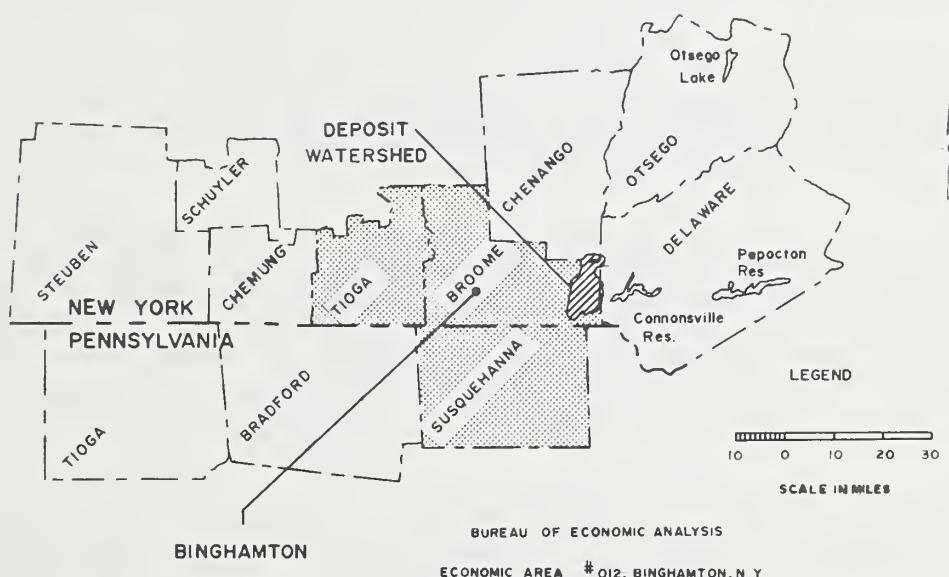


FIGURE 5 - BEA MAP

Comparative present and projected population and per capita income estimates for BEA Economic Area 12, Binghamton SMSA, and Deposit Watershed are shown in Table F.

TABLE F- PRESENT AND PROJECTED POPULATION AND PER CAPITA INCOMES

Year	BEA 1/ Economic Area 12	Binghamton 2/ SMSA	Deposit Watershed
<u>Population</u>			
1970	767,040	303,204	3,500
1980	779,700	312,200	3,570
2000	830,300	340,100	3,715
<u>Per Capita Income</u>			
1970	3,193	3,441	2,950 3/
1980	4,500	4,800	4,130
2000	7,800	8,300	7,145

1/ U.S. Water Resources Council: 1972 OBERS Projections: Regional Economic Activity in the United States, Vol. 2, BEA Economic Areas, U.S. Government Printing Office, Washington, D.C.

2/ Ibid, Vol. 5, Standard Metropolitan Statistical Areas.

3/ U.S. Department of Commerce, 1970 Census of Population: General Social and Economic Characteristics, New York, Average of Per Capita Incomes for Broome and Delaware Counties.

The watershed population represents only 1 percent of the Binghamton SMSA (as shown in Table F); however, its residents depend upon the larger economic unit to help sustain their own economy. The watershed's population is not expected to increase appreciably as there is room for development in areas closer to the city of Binghamton, the principal employment center.

ECONOMIC RESOURCES

The village of Deposit is the main population center of this rural watershed. Manufacturing forms the economic base of the community; however, agriculture, tourism, and services contribute to its economy.

In addition to local employment, watershed residents commute to Binghamton (30 miles) and Sidney (25 miles) primarily for employment in the manufacturing sector.

The watershed's largest industrial employer is a plant which produces particle board. It supports an annual payroll of about \$1,300,000 and purchases an estimated \$1,000,000 worth of raw materials and supplies from the area annually. About 75 percent of the plant's 100 employees live in the Deposit community. Smaller industries such as a dress manufacturer and two printing plants are located in Deposit.

Agriculture and tourism contribute to the economy of the watershed on a relatively minor scale. Fewer than 20 active farms, almost exclusively devoted to dairy production, were identified in 1973. Average gross sales of \$12,000 were reported for area farms in 1969.

The local retail stores and service establishments provide a significant element of the watershed's economy. Such stores are primarily small convenience outlets and service establishments.

Most of the watershed is privately owned; however, the State of New York owns Oquaga Creek Park (557 acres) and state forest lands (4,160 acres). For location of state ownership, see Project Map, Appendix D.

Open land formerly cropped sells for \$400 to \$700 per acre; whereas, cropland and hayland in the valleys and gently sloping areas sells for \$800 to \$1,200 per acre. Undeveloped lots in the village of Deposit sell for \$3,000 to \$4,000.

New York Route 17 passes below the watershed, linking it with New York City to the southeast and Binghamton and Route 81 to the west. (See Figure 2.) Conrail provides freight service to the village of Deposit.

The watershed lies in the South Central New York Resource Conservation and Development District and the Appalachia Development Region. It also lies within the area under authority of the Delaware River Basin Commission.

PLANT AND ANIMAL RESOURCES

Open fields, broken by scattered hedgerows, wet areas, and streambelts typify the valleys of the watershed. The broader valleys of Oquaga

Creek and Butler Brook support more agriculture than the narrow valleys of the tributaries. The irregularly shaped uplands are extensively forested. Fringes of forest extend down the hill-sides linking the ridges to the valley bottoms. Land formerly cropped on the upper hillsides delineates previous boundaries of agriculture. Overgrown pastures are common to the steep hillsides and provide a transition zone between forest land and openland.

Agricultural land (10,253 acres) comprises 21 percent of the present land use (see Table G for plant species). Slightly greater than half of this is rotational cropland with a small amount of continuous corn. Crop production is primarily in support of the dairy industry with the most common rotation being 2 years of corn followed by 3 years of hay. This results in two-fifths of the cropland being corn and three-fifths being hay. The corn is produced primarily for silage, providing little winter food or cover for wildlife. Two to three cuttings of hay are taken annually with the first generally being before the hatching of ground nesting birds.

Pastures of native plants with varying degrees of domestic grasses, legumes, and shrubs, comprise the remaining agricultural land. Intensive management is uncommon, and native grasses and herbaceous plants are most often encountered. Woody plants are common to the steep unmowed hillside pastures.

The open land formerly cropped (1,586 acres) varies in vegetative composition due to natural succession. Early stages are primarily herbaceous plants becoming a mixture of predominantly woody plants before progressing to forest. Most of the open land formerly cropped in the watershed contains less than 30 percent woody plants. These diverse areas provide a transition zone between forest land and open land and produce a variety of forage, browse, and fruits highly utilized by the wildlife of the watershed.

Approximately 73 percent (35,400 acres) of the watershed is forested. The northern hardwood and oak types, with their associated species, comprise most of the forest cover. Sugar maple and red maple occurring with beech, black cherry, and white ash are the most often encountered overstory species. The understory composition is primarily overstory reproduction. The high occurrence of maples, with a small number of nut trees, results in low mast production.

Presently, frequent cutting of immature stands occurs throughout the watershed. This has contributed to a small acreage developing into sawtimber stands (25 percent). Immature stands (pole 30 percent and sapling 45 percent) are most common. The sawtimber stands have

TABLE G - COMMON PLANT SPECIES OF PRESENT LAND USES

LAND USE	ACRES	SPECIES
Cropland	5,920	Hay - timothy, alfalfa, birdsfoot trefoil Silage and Grain - corn
Pasture	4,333	Domestic grasses and legumes - timothy, alfalfa, birdsfoot trefoil Native herbaceous plants - bluegrass, quackgrass, crabgrass, Canada thistle, burdock, dandelion, plantain, milkweed, goldenrod, strawberry Woody plants - northern hardwood saplings, thornapple, shadbush, viburnum, lowbush blueberry, chokecherry, apple, raspberry, sumac, blackberry, hardhack
Openland Formerly Cropped	1,586	Native herbaceous plants - see pasture herbaceous plants Woody plants - see pasture woody plants
Forest (Northern Hardwoods)	34,287	Overstory - sugar maple, red maple, beech, black cherry, white ash, hemlock, white pine, yellow birch, white birch, black birch, elm, aspen, basswood, red oak, white oak, chestnut oak, shagbark, hickory Understory - overstory reproduction, stripped maple, hophornbeam, blackberry, raspberry, elderberry, alternate dogwood, ferns, grasses
Forest (Plantations)	1,080	Overstory - red pine, Scotch pine, Norway spruce, larch Understory - northern hardwood saplings
Wetlands	228	Type 2 - sedge, spikerush, cattails, common rushes Type 3 - cattails, burreed, sedge, arrowhead, pickerelweed, arrow-arum, bulrush Type 4 - pondweeds, coontail, duckweed Type 5 - pondweeds, wildcelery, coontail, watermilfoil, waterlilies Type 6 - alders, willow, buttonbush, dogwood
Water	103	Pondweeds, watermilfoil, coontail, waterlilies, duckweed
Urban	369	Ornamental trees, shrubs, and grasses
Other	531	None
Total	48,437	

low understory densities. Frequent cutting of the immature stands, however, creates a high understory density increasing the abundance of browse and amount of edge.

Small plantations (less than 50 acres in size) of various species of pine, spruce, and larch cover about 1,080 acres. These plantations are generally under 25 years of age and have a very dense crown canopy. Understory growth occurs only where openings exist naturally or from cuttings. Species typical of the hardwood forest occupy these openings.

The extensive forest land and the distribution of open land favors the abundance of forest wildlife species. Cottontail rabbits are common throughout the agricultural valley. These grassy open areas are also utilized for forage by forest wildlife. The frequent cutting of immature stands produces habitat favored by whitetailed deer, ruffed grouse, and snowshoe hare which occur in moderate to high densities. Moderate densities of gray squirrels and wild turkeys occur in localized sawtimber stands with ample mast production. Songbirds and nongame species of wildlife are common throughout the area. A taxonomic listing of plants, mammals, birds, reptiles, amphibians, and fish common to the watershed may be found in Appendix G.

Beaver activity has been responsible for the creation of 113 acres of wetland. However, wetland types 3 and 4 which support abundant vegetation, creating high quality habitat for waterfowl, a variety of shorebirds, and mammals exist only in small amounts. The active ponds are primarily type 5 with nesting cover limited to the shoreline. The high amount of forested shoreline creates ideal habitat for woodducks, but restricts ground nesting species.

Wetlands created by beaver are temporary in nature and many ponds in the watershed have been abandoned as beaver move away when existing food supplies have been consumed. The loss of water retention following dam deterioration results in lower quality habitat. Although these areas are used by waterfowl, size limits waterfowl numbers and increases chances of predation. Type 2 wetlands in the watershed afford little wildlife habitat. Pasturing or cultivation of 55 acres during dry years prevents natural successions. However, the type 2 wetlands which are adjacent to areas of beaver activity do produce food and nesting cover for shorebirds and waterfowl.

Quaga Creek supports a moderate quality trout fishery of regional significance which is the core of sport fishing in the watershed.

Native brook trout are predominant in the stream's headwaters, including tributary 21 and Page Pond Brook. Small pockets 12 to 18 inches deep are typical in these sections which have a moderately steep gradient and coarse rubble bed material. Infrequent pools, fallen trees, and overhanging vegetation provide limited cover for larger fish. These well vegetated channel banks maintain suitable water temperatures, with a summer high of 68 degrees Fahrenheit. Competition from rough species of fish is low (see Table H for species).

TABLE H - STREAM FISHERIES BY REACH

Reach	Stream	Length (miles)	Sport Fishery	Stocking Rate/Mile	Component Species
1 & 4A	Bone Creek	2	None	None	American eel, blacknose dace, common shiner, fallfish, white sucker, creek chub.
2	Big Hollow Creek	7	Low quality brown trout	None	
3	Butler Brook	5	None	None	
4 & 5	Oquaga Creek (Lower)	5	Moderate quality brown trout	610 brown trout yearlings	Fallfish, smallmouth bass, pickerel
7	Oquaga Creek (Middle)	4	Moderate quality brown trout	280 brown trout yearlings	rock bass, sunfish, white sucker,
10	Oquaga Creek (Upper)	10	Moderate quality brown and brook trout	420 brown trout fingerlings	johnny darter, blacknose dace, longnose dace, cutlips minnow, stonewall, stone-roller, shield darter, common shiner, green sunfish, brown bullhead, creek chub, lamprey eel, American eel, red-bellied sunfish.
6 & 6A	Fly Creek	12	Moderate quality brook and brown trout	None	Blacknose dace, common shiner, creek chub, rock bass, sunfish, brown bullhead.
8	Marsh Creek	12	None	None	Blacknose dace, longnose dace, creek chub, stoneroller.
9	Tributary from Beaver Pond Sanford	6	Low quality brown trout	None	Brown bullhead, pickerel, longnose dace, fallfish, blacknose dace, creek chub, common shiner, stonewall, pumpkinseed, johnny darter, cutlips minnow, American eel.
	Page Pond Brook	3	Moderate quality brook trout	None	Blacknose dace, common shiner.
	Tributary 21 through Arctic	4	Moderate quality brook trout	None	Blacknose dace, common shiner

Brown trout become predominant below North Sanford as Oquaga Creek flows through the broad agricultural valley to its mouth. Stream meandering, fallen trees, and riprap create large pools, with depths often exceeding 4 feet. Pool frequency is low with 6-to 8-inch deep riffles comprising most of the stream. Coarse rubble is a common bed material in short sections of fast flow, but silt and gravel are more characteristic as is a flatter gradient. Stream shade cover varies from near nonexistent in areas of pasturing and intensive cropping, to abundant in the less intensively used areas. A frequent stream exposure to sunlight in conjunction with shallow depths creates warmer water temperatures with summer highs of 74 degrees F. Competition is in evidence with a large population of rough fish which are more suited to the higher temperatures. Annual stocking of brown trout yearlings occur throughout Oquaga Creek (see Table H for rates) to help maintain the fishery.

Fly Creek provides seasonal fishing for brook and brown trout. The narrow, moderately steep stream is comprised primarily of gravel riffles providing a spawning area for the Oquaga fishery.

Cool water temperatures exist with summer highs of 68 degrees F. Pools capable of retaining catchable sized fish comprise about 10 percent of the stream. The larger pools with depth of 2 feet are found at road or bridge crossings. The discharge of warm water alters the fishery directly below Fly Pond, Deer Lake, and Sky Lake. Warm water species typical of the impoundments are found for short distances below the outlets. Flow in the remaining tributaries of Oquaga Creek and the Butler-Big Hollow drainage is generally intermittent or too low to support a sport fishery and contain only minnow species. Stream widths are less than 15 feet with depths seldom greater than 12 inches. Moderately steep gradients and rubble bottoms are common. Trout are present in the lower mile of Reach 9 and 750 feet of Big Hollow Creek. These short sections of marginal habitat support small trout populations.

Ponds and lakes presently comprise 219 acres of the watershed. Habitat for warm water fish is afforded by seven lakes or ponds exceeding 3 acres and approximately 40 farm ponds ranging to 1 acre in size. The larger water bodies include Palmer Pond, 7 acres; Summit Lake, 15 acres; Deer Lake, 30 acres; Page Pond, 9 acres; Deposit Reservoir, 13 acres; Fly Pond, 35 acres; and Sky Lake, 26 acres.

The recently completed 60 acre lake in Oquaga Creek State Park at Artic will create an additional fishery which will be open to the public. Present plans include trout stocking and management.

Maximum water depths of the larger lakes are approximately 20 feet, while most ponds are less than 10 feet. The shallow waters support a variety of vegetation including yellow pond lilies, muckgrass, water milfoil, coontail, and pondweeds. Fish species present include smallmouth bass, largemouth bass, common sunfish, chain pickerel, brown bullhead, yellow perch, golden shiner, and sunfish.

There is no known occurrence of endangered or threatened species in the watershed.

RECREATIONAL RESOURCES

The Deposit Watershed is picturesque with broad, deep, valleys, dairy farms, and extensive forests, creating a pleasant setting

for outdoor recreation. Recreationists will normally drive an estimated 30-40 miles to participate in day-use activities, such as picnicking and swimming. The area from which the recreationist travels to a given facility is called the "local area of influence" (LAI). The LAI for the watershed consists of about half of Delaware and Broome, one-third of Chenango, a small corner of Otsego Counties in New York, and a small portion of Susquehanna and Wayne Counties in Pennsylvania (Figure 6). The state boundary between New York and Pennsylvania can be considered as somewhat of a psychological barrier which reduces movement of recreationists between states for day-use recreation. This may be as a result of a desire to patronize their own state facilities or not knowing what facilities are available in the other state.

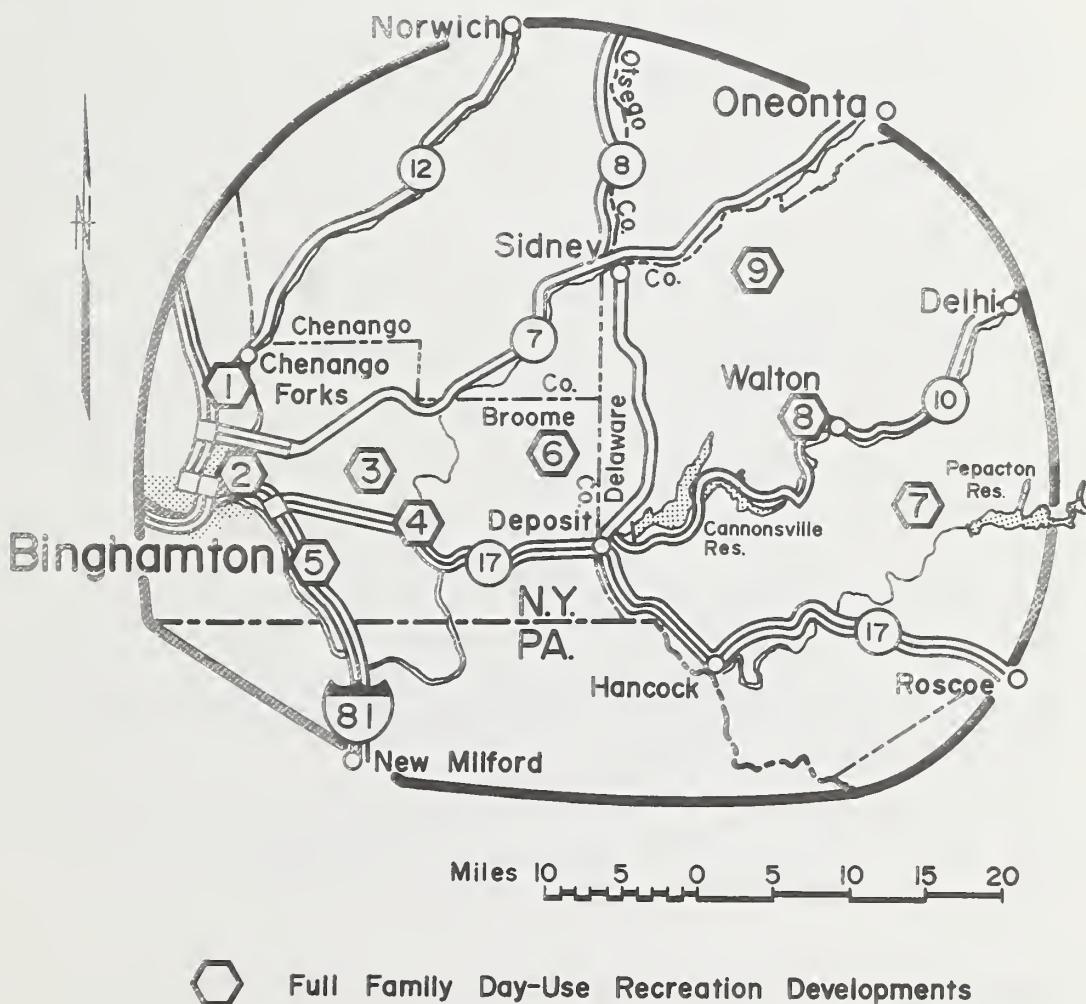


FIGURE 6 - LOCAL AREA OF INFLUENCE

Within the LAI there are nine full family day-use recreation developments. These developments provide picnicking, swimming, and play area facilities. Three of these are state developments, one county, and five are town and/or village. (See Table I.)

TABLE I - FULL FAMILY DAY-USE RECREATION DEVELOPMENTS^{1/}
WITHIN THE LAI OF DEPOSIT WATERSHED

MAP CODE	RECREATION DEVELOPMENT BY COUNTY	WATER AREA	FACILITIES						
			CAMPING	PICNICKING	PLAY AREAS	SWIMMING	FISHING	BOATING	OTHER
<u>Broome County</u>									
1	Chenango Valley State Park	63 Ac. Lake	X	X	X	Beach	X	X	Golf
2	Hyder Town Park	---	-	X	X	Pool	-	-	--
3	Nathaniel Cole Co. Park	55 Ac. Lake	X	X	X	Beach	X	X	--
4	Merritt Knapp Town Park	---	-	X	X	Pool	-	-	--
5	Conklin Town Park	---	-	-	-	Pool	-	-	--
6	Oquaga Creek State Park ^{3/}	60 Ac. Lake	X	X	X	X	X	-	--
<u>Delaware County</u>									
7	Bear Springs State Wildlife Mgmt. Area	16 Ac. Pond	X	X	X	Pond	X	-	Hunting
8	Austin-Lincoln Town Park	---	-	X	X	Pool	-	-	--
9	East Sidney Dam Town Park	200 Ac. Reservoir	X	X	X	Beach	X	X	Launch Ramp

^{1/} Full family day-use recreation developments are those that provide picnicking, swimming, and a play area.

^{2/} Location of facilities shown in Figure 6

^{3/} Under development

This state is currently developing Oquaga Creek State Park in the northern part of the watershed. It will have a 60-acre lake, campsites, picnic facilities, play areas and a beach.

In addition to the present facilities listed in Table I, there are approximately 20-25 other areas that provide facilities for either picnicking or swimming.

The Cannonsville Reservoir and the Pepacton Reservoir (4,800 and 5,696 surface acres, respectively) afford opportunity for fishing from shore and rowboats by special permit.

ARCHEOLOGICAL, HISTORICAL, AND UNIQUE SCENIC RESOURCES

The National Register of Historic Places lists no properties in the watershed such as historic districts, sites, buildings, structures, or objects which are significant in American history, architecture, archaeology, or culture.

The State Historic Preservation Officer has indicated that they have no information on cultural resources in the area. The Director, Public Archaeology Facility at the State University of New York at Binghamton, has reported that they have no archeological sites recorded on their site location maps for this area. However, he indicates that it is his opinion that the negative data are insignificant.

Qualified members of the Broome County Environmental Review Committee have inspected the area and verbally indicated that no cultural resources exist in the area that would be impacted by the proposed structural resources. In addition, an SCS technician has made a literature search and a walkover reconnaissance of the affected areas. No cultural resources were noted during this inspection.

The Historic American Buildings Survey records two buildings in the village of Deposit. They are, (1) the Edick Conrad House on River Street, and (2) the Palmerton House on 2nd Street. These houses were located by an SCS technician, and as shown on the map in Appendix I, they will not be impacted by the planned structural measures.

In the event that cultural resources of archeological or historical significance are uncovered by the Soil Conservation Service or brought to its attention by others during construction, the Office of Parks and Recreation and the National Park Service will be notified. Appropriate arrangements will be made for survey or salvage as needed.

SOIL, WATER, AND PLANT MANAGEMENT STATUS

Expected changes, over the next 25 years, in land use (Table J) include a reduction in cropland, open land formerly cropped, and pastureland which will become forest land. Portions of an area (partially floodprone) bounded by New York State Route 10, Butler Brook, the village corporate limit, and existing urban development have been identified by village of Deposit officials as the location of future urban development. The principal land use of this area is cropland.

TABLE J - FUTURE LAND USE (2000)

Land Use	Acres	Percent
Cropland	5,204	11
Open land formerly cropped	356	1
Pastureland	2,287	5
Forest land	39,121	80
Urban land	595	1
Other land	584	1
Water	290	1
Total	48,437	100

There is no indication that there is going to be any significant change in the current trend in forest land use. The ownership pattern is stable and, with few exceptions, there are no changes contemplated for the future.

Forest fire protection is being provided by local volunteer fire companies and the New York State Department of Environmental Conservation in cooperation with the U.S. Forest Service through the Clarke-McNary Cooperative Forest Fire Protection Program. There have been no fires on the watershed within the past 5 years, and the present protection system is considered adequate.

The Broome, Delaware, and Chenango County Soil and Water Conservation Districts have been conducting intensive conservation programs in their respective parts of the watershed. About 37 percent of the land area within the watershed is under district agreement. There are 64 district cooperators (17,843 acres) in the watershed, of which 48 have conservation plans (14,582 acres). Approximately 10 percent of the planned practices on the cropland have been applied. Planned pasture management practices have been applied to about 15 percent of the pastureland. "Land adequately treated" includes about 2,825 acres of land. Land adequately treated is defined as land on which all planned improvements have been applied.

It is estimated that 95 percent of the land in the watershed is adequately protected or that the annual soil loss is within tolerance limits of the soils occurring in the area. "Land adequately protected" is defined as land on which the soil, water, and related plant resources are adequately protected from deterioration, either naturally or by action of the land user.

Factors of production (land, labor, and capital) are being inefficiently applied to about 184 acres of capability subclass Vw, cropland. About 8 acres of pasture in capability subclass VIe are being inefficiently used.

PROJECTS OF OTHER AGENCIES

In the Oquaga Creek Watershed, the New York State Division of Parks and Recreation has let contracts for Oquaga Creek Park near Artic, New York. This recreational park will have facilities for water based recreation and camping from primitive to advanced. A manmade lake of approximately 60 acres has been constructed to date. The cost estimate for construction of the park is 4.5 million dollars.

The New York State Department of Environmental Conservation has maintained a "Fish for Fun" stretch of stream on Oquaga Creek (fish caught must be released). The section begins at the village of McClure and continues downstream to the railroad bridge, crossing about 1/3 mile west of the village limits of Deposit. In addition, New York State has acquired fishing rights (or easements) on Oquaga Creek which total 5.3 miles. Under the Flood Control Act of 1950 (P.L. 516, Section 216), emergency watershed protection work was done on Oquaga Creek in the vicinity of McClure. Work was done on Bone Creek below the railroad. Work was done on Butler Creek above Elm Street for a distance of approximately 1,000 feet.

After the storm of July 1970, the U.S. Corps of Engineers supervised reconstruction of portions of the concrete flume on Bone Creek through the village of Deposit.

A study of the Upper Delaware River Basin is currently being performed by the U.S. Corps of Engineers under the sponsorship of New York State. The village of Deposit is presently installing a sanitary sewer system.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND AND WATER MANAGEMENT

The size of farms are increasing and the number of farms are decreasing. The better land is being kept in cropland, but the rotations are becoming more intensive with a corresponding increase in soil erosion. Approximately 2,359 acres of sloping cropland are subject to soil erosion. The average annual soil loss on these lands is about 4.9 tons per acre. Continuous row cropping is practiced on much of this land, resulting in water and nutrient losses.

Idle lands formerly cropped are changing from weeds to shrubs and low trees such as thornapple and other hardwood tree species. Very little economic benefit is obtained for the owners from this land at this successional stage.

A number of nonfarmers own the farmland and the land is rented back to farmers. This situation makes it more difficult to arrive at sound decisions on land use and conservation treatment.

There are about 179 acres of capability subclass Vw and 7 acres of VIe pastureland that should have adjustments in land use. Steep slopes and/or rocky conditions limit the application of management practices. Approximately 450 acres of capability subclass IIIw and 80 acres of IVw cropland need drainage or other water control measures to improve yields and increase efficiency of use.

Lack of proper forest management has resulted in some overmature stands, overcrowding of immature stands, poor species growth and vigor, and disease.

The primary forestry problem within the watershed is high grading and indiscriminate cutting of immature stands. Particle board operations utilize trees up to about 14 inches diameter breast high. As a result, a large quantity of small sawtimber is being removed and future quality sawlogs are taken from the forest. This operation is presently in direct conflict with area sawmill operations.

Improper location or maintenance of logging roads and skid trails has resulted in rapid runoff causing erosion and sedimentation. Grazing of forested areas has also impaired hydrologic conditions through soil compaction and reduction of vegetative cover and litter and humus volume.

The hydrologic condition of the forest land ranges from fair to good. The ability of this land to improve hydrologically is only fair, thereby limiting efforts toward maintenance or improvement.

FLOODWATER DAMAGE

An estimated \$73,650 in average annual floodwater damages are expected to occur during the 100-year evaluation period. These land and structure damages include urban damages of \$55,025, road, bridge, and structure damages of \$17,525, and other agricultural damages of \$1,100.

Urban floodwater damages include damages to structures and contents of residential, commercial, and public buildings, induced protective (i.e., cellar pumping) measure costs, and damages to public utilities. Other agricultural floodwater damages include floodwater damages to farm buildings, fences, farm machinery, and livestock. Road and bridge damages involve public roads and public and railroad bridges. Concrete channel floodwater damages involve floodwater damages to the existing Bone Creek concrete lined channel.

The price base for the estimated floodwater damages is 1977 prices; however, urban damages were adjusted for anticipated changes in "real" values. It was assumed that "real" damageable value of content will increase at the same rate as projected (OBERS) increases in per capita income. Structural values were not adjusted. Two evaluation units have been identified in Deposit Watershed. Evaluation Unit Number 1 consists of areas subject to flooding from Bone Creek, Butler Brook, hillside runoff, and Quaga Creek. Flooding from these floodwater sources affect common flood plain and primarily causes damage to the village of Deposit. Evaluation Unit Number 2 consists primarily of areas subject to floodwater damage from Marsh Creek.

Average annual floodwater damages of \$70,380 (including urban damages of \$62,585, and road, bridge, and structure damage of \$15,355) are occurring in Evaluation Unit Number 1 (village of Deposit). Approximately 179 residences, 32 commercial buildings, 20 bridges, and 2,500 feet of streets would be affected by the 100-year frequency flood event. Approximately 640 residents of floodprone areas as well as owners and employees of 32 businesses would be adversely affected by a 100-year frequency flood event.

Damages from high flows combined with debris is occurring to sections of the Bone Creek concrete channel. Deterioration of the concrete is coupled with an undermining of the channel walls and bottom.

Although the total area affected is small, the consequences caused by lack of maintenance are great because this deterioration and undermining could result in the eventual collapse of the channel walls which would block the bridge openings. (See Appendix D, Urban Flood Plain Map.)

Floodwater damages begin with the 2-year frequency flood event 1/ on the Butler Brook flood plain, the 10-year frequency flood event on the Bone Creek flood plain, and 10-year frequency event in the Borden Street (Oquaga Creek flooding) sections of the village of Deposit. In addition, annual floodwater damages caused by hillside runoff are causing street and residential damages to Court Street, Lippincott Street, Fordhill Street, Pine Street, Wheeler Street, and Sunrise Terrace sections of the village.

Average annual floodwater damages of \$3,270 are occurring in Evaluation Unit Number 2 (Marsh Creek), including other agricultural damages of \$1,100 and road and bridge damages of \$2,170. Flood damages begin with the 10-year frequency flood event. A 100-year frequency flood event would affect one farmstead, and portions of farm to market road (including one bridge).

STORM OF RECORD

The storm of record occurred on July 3, 1970, and varied in intensity throughout the watershed. The storm approximated a 100-year storm frequency event in the western part of the watershed (Oquaga and Bone Creeks); whereas, it was less severe and approximated the 5-year frequency storm in the Butler Brook area.

The Borden Street area and lower Marsh Creek received the most severe concentrations of damage from Oquaga Creek. In addition, cropland along Oquaga Creek was damaged. Bone Creek, which

1/ A 2-year frequency flood event has the probability of occurring on the average of once every 2 years or has a 50 percent probability of occurring in any given year.

became blocked by debris and partial collapse of the concrete channel, flooded the business district in Deposit and residences along Allen, First, and Second Streets. Butler Brook flooded businesses and residences within the village limits and caused lesser damages to residential and agricultural lands above the village.

INDIRECT FLOOD DAMAGE

An estimated \$7,440 in average annual indirect flood damages are occurring in the watershed. These damages reflect monetary losses caused by flooding even though physical losses don't occur. These losses include costs of delays of railroad shipments, rerouting of vehicular traffic, inconvenience and time lost by evacuation of residences, and closings of commercial establishments.

CHANGED LAND USE

Village of Deposit officials have indicated that future urban development will be located in an area (partially floodprone) bounded by New York State Route 10, Butler Brook, the village corporate limit, and existing urban development. Floodproofing (i.e., use of fill) of new structures as they are built on floodprone areas of the site will be necessary, thus increasing development costs by about \$9,325 annually.

EROSION DAMAGE

Erosion, the wearing away of the land surface by water, wind, ice, or other geological agents, is occurring as sheet erosion, roadbank erosion, and streambank erosion throughout the watershed. Sheet erosion is the removal of a fairly uniform layer of soil from the land surface by runoff water. Erosion rates for Bone, Butler, and Big Hollow Creeks, and Oquaga Creek are shown in Tables K and L.

TABLE K - EROSION RATES - BONE, BUTLER, BIG HOLLOW

SHEET EROSION

Land Use*	Tons/Acre/Year	Acres	Total Tons/Year
Cropland			
Adequately Treated	2.1	1,028	2,159
Needing Treatment	6.8	487	3,312
Open Land Formerly Cropped	.3	363	109
Pastureland	1.4	782	1,095
Forest land	.5	3,307	1,654
Urban and Other	.6	241	145
Subtotal			8,622

OTHER EROSION

	Tons/Bk Mi/Year	Miles	Total Tons/Year
Roadbank	86.1	23	1,980
Streambank	32.4	26	842
Subtotal			2,822
TOTAL			11,444

*Excludes 28 acres of land use which does not produce sediment such as water, impervious surfaces, etc.

A major erosion problem in the watershed occurs on inadequately treated cropland. This represents areas where crops are grown on too steep slopes, the wrong crop rotations are used, or the soils are highly erosive. Although this land use comprises only 8 percent of the drainage area in the Bone-Butler-Big Hollow complex, it contributes 40 percent of the gross sheet erosion. In the Oquaga Creek area, this same land use occupies approximately 1.5 percent of the drainage area and is responsible for 12 percent of the gross erosion. A potential erosion hazard also exists on grazed forested areas bordering streams. Roadbank erosion rates are high in the Bone Creek-Butler Big Hollow complex, and Oquaga Creek area, at 86 tons per bank mile and 52 tons per bank mile, respectively.

TABLE L - EROSION RATES - OQUAGA CREEK

SHEET EROSION

Land Use *	Tons/Acre/Year	Acres	Total Tons/Year
Cropland			
Adequately treated	2.3	2,459	5,656
Needing Treatment	4.9	1,946	9,535
Open Land Formerly Cropped	.2	1,223	245
Pastureland	.8	3,630	2,904
Forest land	.5	32,093	16,047
Urban and Other	.2	128	26
Subtotal			34,546

OTHER EROSION

	Tons/Bk Mi/Year	Miles	Total Tons/Year
Roadbank	52.0	186	9,672
Streambank	38.8	198	7,682
Subtotal			17,354
TOTAL			51,900

*Excludes 191 acres of land use which does not produce sediment such as water, impervious surfaces, etc.

The major reason for these high rates is steep banks along dirt roads in steep topographic areas.

The most visible erosion in the watershed is streambank erosion. Raw streambank areas occur on all streams. Streambank erosion rates for Bone-Butler-Big Hollow, and Oquaga Creeks are 32 and 38 tons per bank mile, respectively. Land loss though streambank erosion throughout the watershed is estimated to be 1 acre per year.

The actual area affected by flood plain scour is estimated to be 4 acres. Depth of scour is not severe, however, and remaining damages are slight.

Not all soil particles disturbed by eroding forces reach a waterway to be transported through and out of the watershed. The portion that reaches the mouth of a watershed from the sediment sources is a percentage of the total gross erosion and is known as the net sediment.

Streambank erosion is a critical sediment source since, when streambank material erodes, it falls directly into the stream. In Bone-Butler-Big Hollow, streambank erosion is responsible for 23 percent of the net sediment delivered to the mouth of the watershed. In Oquaga Creek, streambank erosion contributes 51 percent of the net sediment.

SEDIMENT DAMAGE

Sediment is soil and rock particles that result from erosion. These particles are deposited over a period of time in stream channels and lower lying watershed areas. These sediments have the potential to pollute the water, reduce stream channel capacity (thereby increasing out-of-bank flooding), and destroy fishery habitat.

The major sediment damage in the watershed results from bedload deposition in the Bone-Butler-Big Hollow Creek channels and the resultant loss of channel capacity. Channel cleanout has been undertaken along sections of these streams at periodic intervals. The amount of material removed is not available; however, the average annual cost of channel cleanout is estimated at \$2,740.

Sediment deposition on agricultural lands is of limited extent and is estimated to encompass a total of 4 acres, with little remaining damage following the initial deposition.

Average annual sediment discharge (net sediment) at the mouth of the watershed is 3,300 and 13,616 tons for Bone-Butler-Big Hollow Creeks and Oquaga Creek, respectively. These are equivalent to average annual sediment concentrations of 219 and 146 milligrams per liter. The average sediment concentration does not represent conditions that are present within the stream system throughout the entire year. Very high sediment concentrations occur during limited periods of spring runoff or intense summer storms. Sediment concentrations during the remainder of the year are very low due to low flow.

There have not been any reported damage or problems downstream due to sediment from the watershed.

RECREATION PROBLEMS AND NEEDS

The "New York Statewide Comprehensive Recreation Plan - Forecast of Outdoor Recreation in New York 1970-1990," indicates that present "day-use" and boating facilities will not be used to capacity in 1990 (Table M). However, camping, hunting, and fishing facilities will be overused and thus there will be a need for additional facilities or a diversion of recreation pressure away from over-used and sensitive areas.

TABLE M - PROJECTED RECREATION FACILITY USE IN 1990

FOR DEPOSIT WATERSHED AREA 1/

Facilities	Use/Capacity 1900 2/ (Average Weekend Day)
Day-Use	65
Fishing	106
Boating	76
Hunting	140
Camping	125

1/ "Forecast of Outdoor Recreation in New York 1970-1990," New York State Comprehensive Recreation Plan, New York State Parks and Recreation, Albany, New York, 1973. Facilities planned for Oquaga Creek State Park are included in the data.

2/ Figures over 80 indicate potential need for additional facilities.

PLANT AND ANIMAL PROBLEMS

Wetlands created by beaver activity are temporary in nature. The large number of beaver ponds represents a sizable portion of the watershed wetlands and creates only temporary aquatic habitat. Presently wetland types 3 and 4, which are of high value to waterfowl, are not abundant.

Pasturing of livestock occurs on type 2 wetlands and in a small percentage of the forest land. This practice prevents the natural development of native plant species, thus deteriorating wildlife habitat.

Frequent cutting creates a large amount of browse resulting in high whitetailed deer populations. These excessive deer populations will overbrowse forest stands resulting in habitat deterioration and poor forest regeneration if excess animals are not harvested annually.

High water temperatures limit trout production in many areas throughout the trout fisheries of the watershed. Loss of shade from streambank erosion and streambank grazing, in conjunction with shallow water depths, has created high water temperatures. Although direct mortality of trout species from high water temperatures has not been known to occur, a high degree of competition with rough fish species suited to warm temperature has limited the fishery.

Pools capable of providing cover for catchable size fish represent less than 35 percent of the water area in the streams containing trout. This lack of habitat limits the size of fish produced.

Public access is not available for any of the warm water fisheries in the watershed. Posting restricts access for hunting to all areas except state land and a small amount of private land.

Pollution has restricted development of game fish species in Butler Brook.

WATER QUALITY PROBLEMS

The only identified water quality problem in the watershed exists in the Butler-Big Hollow area where there is evidence

of pollution. The fecal/fecal strep ratio indicates human waste as the probable source of fecal contamination. Any more extensive use of the water than presently exists would require control of this source of pollution. (See Appendix H, Water Quality Data.)

ECONOMIC AND SOCIAL PROBLEMS

In 1969, 11.3 percent of Delaware County's families received incomes below the national poverty level. This compares with a figure of 8.5 percent for New York State 1/

The unemployment rate in Delaware County in October 1976 was 7.6 percent, while that for New York State was 8.4 percent 2/. Seasonal variations produce rates both above and below the state unemployment rate. Over the past few years, the average unemployment in the watershed area has been lower than the state's average unemployment. The watershed is located in the Appalachian area.

1/ U.S. Bureau of the Census, Census of Population: 1970, General Social and Economic Characteristics, Final Report PC(1)-34, New York Government Printing Office, Washington, D.C., 1972.

2/ New York State Department of Labor, Manpower Review, November 1976.

RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

There are no known approved or proposed federal, state, or local land use plans which will conflict with the proposed project measures. The proposed project measures conform with the objectives of the Clean Air Act and the Federal Water Pollution Control Act Amendments of 1972.

ENVIRONMENTAL IMPACT

CONSERVATION LAND TREATMENT

The installation of vegetative and structural types of land treatment will effectively reduce runoff, conserve soil moisture, and reduce losses of topsoil. Erosion rates on about 1,825 acres of erosive cropland will be reduced from an average of 5.3 tons per acre per year to 3.0 tons per acre per year. The alleviation of erosion on cropland will reduce losses of fertilizer and other agricultural chemicals, as well as crop losses caused by erosion. Annual quantities of sediment delivered to the mouth of the Bone-Butler-Big Hollow area and Quaga Creek will be reduced from 3,300 tons to 2,557 tons and 13,616 tons to 13,310 tons, respectively. Sediment concentrations at the mouth will likewise be reduced from 219 milligrams per liter (mg/l) to 202 mg/l and 146 mg/l to 143 mg/l.

The forest land treatment program will bring 6,200 acres of forest land under management. Implementation of this program will promote good forest land use practices. Tree planting on 250 acres of idle land formerly cropped will advance the present successional stage, shortening the period of little economic return to the landowner. Controlled harvest cutting on 1,100 acres of mature and overmature stands will increase forest regeneration and stand quality. Forest environmental improvement on 625 acres will also improve stand quality and vigor by reducing overcrowding and eliminating diseased and deformed species. Protection of 600 acres of forest from grazing will increase tree growth and quality, and stand hydrologic conditions. The proper location, installation, and seeding of logging roads and skid trails; and the installation of cross drains or other water diversion devices on 3 miles will slow runoff, thus decreasing erosion and sedimentation.

Total gross sheet erosion on Bone-Butler-Big Hollow will be reduced from 8,622 tons to 7,235 tons annually, or about 16 percent; on Quaga Creek from 34,546 tons to 31,772 tons annually, or about 8 percent. Sheet erosion on inadequately treated cropland on Bone-Butler-Big Hollow will be reduced from 3,312 tons to 1,925 tons annually, or about 42 percent; on Quaga Creek from 9,535 tons to 6,761 tons annually, or about 29 percent. Trout redd survival will increase with the associated decrease in turbidity and siltation.

Land treatment measures will enable landowners to better implement sound land management plans and increase efficiencies of production. Land treatment measures when installed with wildlife considerations are beneficial to wildlife.^{1/} Landowners will be encouraged through forest management plans for multiple use management and conservation plans to incorporate wildlife consideration in practice implementation. Measures installed without these considerations may be detrimental to existing wildlife population.

STRUCTURAL MEASURES

The area to be benefited by the installation of the combined program of land treatment and structural measures is delineated on the project map, Appendix B. Installation of structural measures will reduce average annual floodwater damages to urban areas in the village of Deposit by 98 percent, and all identified flood damages by 96 percent from floods up to the magnitude of the 100-year frequency.

Direct beneficiaries to the proposed project include about 640 people, who would no longer face the threat of loss of life or damage to 179 floodprone houses; and owners, operators, and employees of 32 businesses, now subject to flooding. Damages to one farm, one road, and one bridge will be eliminated. Future urban development costs on 25 acres of crop and pasture in the village of Deposit, to be zoned for future urban development will be reduced.

Out-of-bank flow from Bone Creek, below the proposed floodwater retarding structure site, and from Butler Brook, below the Elm Street Diversion, will be eliminated from up to the 100-year frequency storm event. Flooding from up to the 100-year frequency event will be eliminated in areas protected by dikes along Butler Brook (above the Elm Street Diversion) and along Quaga Creek (Borden Street area). Hillside areas immediately below the diversion to Palmer Pond will be protected from 100-year frequency storm events with lesser degree of protection downhill from the diversion; however, those areas not below the diversion will continue to sustain flooding at present rates.

^{1/} Anonymous (1970), Land Use and Wildlife Resources. National Academy of Sciences, Washington, D.C., 262 pages.

The farmstead, and road and bridge, located below the farmstead will be protected from up to 100-year frequency storm floods by the dike and trash rack located on Marsh Creek. (See Project Map, Appendix C.)

Total structural measures will reduce flood damage from \$73,650 to \$1,650. Flood damage to other agricultural properties will be reduced from \$1,100 to \$50; urban floodwater damages will be reduced from \$55,025 to \$820; road, bridge and structure damages will be reduced from \$17,525 to \$780. The sediment damage will be reduced from \$2,740 to \$1,370, and indirect damage will be reduced from \$7,440 to \$550. This will result in total benefits of \$80,260 for floodwater reduction.

The installation of the project will also result in the change land use of 25 acres reducing the development cost by \$9,325. Project installation will create an employment benefit to the watershed of \$9,900.

Land use changes occurring from the installation of two floodwater retarding structures and the channel work will commit 1 acre of cropland, 4 acres of pasture, and 14 acres of open land formerly cropped; also 3 acres of forest land, 2 acres of urban land, 3 acres of water, and 900 feet of intermittent stream. In addition, 1,200 feet of road must be relocated.

Installation of the dike at Borden Street will commit 4 acres of open land formerly cropped. The dike at Marsh Creek will utilize 2 acres of farmstead, however, no buildings are involved.

Structural measures in the Bone-Butler-Big Hollow area will reduce sediment yield from streambank erosion by 60 tons annually. (amount is equivalent to percent reduction in peak flow for the 100-year storm.) Bedload movement in Bone Creek will be reduced by 50 percent. Floodwater retarding structures will trap 426 tons of sediment annually. Sediment concentration at the mouth of the watershed will be reduced from 219 mg/l to 170 mg/l or 22 percent through the combination of structural measures and conservation land treatment.

A short term increase in sediment will be delivered to 3,800 feet of stream with rough fish species and to the Delaware sport fishery and may be observed downstream as a result of runoff during construction. Control requirements specified in contracts and enforced during construction will hold noise, dust, erosion and sedimentation, and similar pollution to a minimum.

Structural measures on Bone-Butler-Big Hollow will increase forage on 6 acres for deer and rabbits and decrease browse by converting open land formerly cropped to permanent grassland. The cover density for ground nesting birds and mammals will increase on 4 acres of pasture and 1 acre of hay which will become permanent grassland. Two acres of urban habitat will become 1 acre of concrete channel, and 1 acre of grass. Songbird habitat will decrease and two acres of gray squirrel habitat will be eliminated. Two acres of water suitable for trout and waterfowl use will be created. Floodflows and sediment delivered to 3,800 feet of stream with rough fish species will decrease.

Installation of the Borden Street dike will eliminate woody vegetation and replace it with permanent grassland. This will decrease browse and increase forage for deer and rabbits.

Habitat changes will involve a decrease in nesting areas for some birds and increase cover for ground nesting birds and mammals.

The dike on Marsh Creek will cause a decrease in the amount of animal waste and debris delivered to the trout fishery of Oquaga Creek.

Floodwater will temporarily inundate 1 acre of forest land and 8 acres of open land formerly cropped, thereby decreasing suitability for ground nesting species and increasing habitat for migrating waterfowl.

The structural measures will provide incidental recreation in the amount of 375 user days annually.

During the period of construction, there will be normal inconveniences of noise and dust pollution from construction equipment and the need for detours around construction areas.

ECONOMIC AND SOCIAL

Labor necessary for construction of the project will result in approximately 16 man-years of labor, while project operation and maintenance will create opportunity for approximately 0.15 man-year of labor annually. In addition to the jobs created, the project will release about \$2,100,000 in the project area which will benefit local businesses.

OTHER

Energy required for the repair and maintenance of houses, buildings, roads, and bridges affected by flooding will be reduced through project installation.

Energy in the form of fuel and related petroleum products will be expended through construction activities over a 5-year installation period.

FAVORABLE ENVIRONMENTAL IMPACTS

1. Reduce floodwater damages to urban areas in the village of Deposit by 98 percent.
2. Benefit directly through flood prevention about 640 people (179 houses), and owners, operators, and employees of 32 businesses.
3. Eliminate damages to one farm, one road, and one bridge.
4. Reduce development costs on 25 acres of cropland and pasture in the village of Deposit to be zoned for future urban development.
5. Reduce erosion on about 1,825 acres of erosive cropland from 5.3 tons per acre year to 3.0 tons per acre per year.
6. Reduce losses of fertilizer and other agricultural chemicals and losses of crop production, caused by erosion.
7. Reduce annual quantities of sediment delivered to the mouth of the Bone-Butler-Big Hollow area and Oquaga Creek from 3,300 to 2,557 tons, and 13,616 to 13,310 tons, respectively.
8. Bring 6,200 acres of forest land under management.
9. Increase forest regeneration and improve quality of the stands.

10. Reduce erosion and sediment from logging roads.
11. Increase future value of sawtimber stands.
12. Reduce total gross sheet erosion on Bone-Butler-Big Hollow from 8,622 tons to 7,235 tons annually, or about 16 percent.
13. Reduce total gross sheet erosion on Oquaga Creek from 34,546 tons to 31,772 tons annually, or about 8 percent.
14. Reduce sheet erosion on inadequately treated cropland on Bone-Butler-Big Hollow from 3,312 tons to 1,925 tons annually, or about 42 percent.
15. Reduce sheet erosion on inadequately treated cropland on Oquaga Creek from 9,535 tons to 6,761 tons annually, or about 29 percent.
16. Reduce sediment concentrations at the mouth of Oquaga Creek from 146 mg/l to 143 mg/l.
17. Reduce sediment concentrations at the mouth of Bone-Butler-Big Hollow from 219 mg/l to 170 mg/l.
18. Reduce streambank erosion by 60 tons annually.
19. Reduce bedload movement in Bone Creek by 50 percent.
20. Trap 426 tons of sediment annually behind structures.
21. Increase forage on 6 acres of open land formerly cropped for deer and rabbits by conversion to permanent grassland.
22. Increase cover density on 4 acres of pasture and 1 acre of hay for ground nesting birds and mammals by conversion to permanent grassland.
23. Increase cover for ground nesting birds and mammals and increase forage for deer and rabbits at Borden Street dike.
24. Create 2 acres of water suitable for trout and waterfowl use.
25. Decrease floodflows and sediment delivered to 3,800 feet of stream with rough fish species.
26. Increase habitat for migrating waterfowl through temporary inundation of 1 acre of forest land and 8 acres of open land formerly cropped by floodwater.
27. Decrease amount of animal waste and debris delivered to the trout fishery of Oquaga Creek.

28. Enable landowners to better implement sound land management plans and increase efficiencies of production through land treatment measures.
29. Provide incidental recreation in the amount of 375 user days annually.
30. Create approximately 16 man-years of labor through construction of structural measures.
31. Increase survival of trout redd through decrease in turbidity and siltation.
32. Reduce energy consumption through reduced repair and maintenance.

ADVERSE ENVIRONMENTAL EFFECTS

1. Commit through construction of structural measures 1 acre of cropland, 4 acres of pasture, 18 acres of open land formerly cropped, 3 acres of forest land, 2 acres of urban land, 3 acres of water, 2 acres of other land, and 900 feet of intermittent stream.
2. Create the normal inconveniences of noise and dust pollution from construction equipment, and the need for detours around construction areas.
3. Create a short-term increase of sediment delivered to 3,800 feet of stream with rough fish species and the Delaware sport fishery.
4. Cause the relocation of 1,200 feet of road.
5. Decrease browse on 10 acres by converting open land formerly cropped to permanent grassland.
6. Decrease songbird habitat.
7. Change 2 acres of urban habitat to 1 acre of concrete channel and 1 acre of grass.
8. Eliminate 2 acres of gray squirrel habitat.
9. Eliminate woody vegetation on 4 acres and decrease nesting areas for some birds.
10. Decrease suitability for ground nesting species on 1 acre of forest land and 8 acres of open land formerly cropped through temporary inundation.
11. Increase fuel consumption through construction activities.

ALTERNATIVES

Alternatives to the project are divided into four categories: land treatment, nonstructural measures, structural measures, and no project. Many combinations of these categories are possible, including some which are not realistic. During the evaluation of alternatives, those which proved to be unworkable, or impossible, were not explored further.

LAND TREATMENT

This alternative would provide accelerated technical assistance to review and make needed revisions of conservation and multiple use management plans to maintain and improve existing cover; to install essential land treatment measures; and to plan and apply land treatment measures applicable to land areas which require treatment. Estimated cost for installation of land treatment measures is about \$700,000.

Land treatment would apply to all of the lands in the watershed. Conservation measures would be applied on cropland, pastureland, forest land, and other land, as described under the "Planned Project" section.

This alternative would cause the following impacts:

1. Reduce erosion on about 1,825 acres of erosive cropland from 5.3 tons per acre per year to 3.0 tons per acre per year.
2. Reduce losses of fertilizer and other agricultural chemicals and losses of crop production, caused by erosion.
3. Reduce annual quantities of sediment delivered to the mouth of the Bone-Butler-Big Hollow area and Oquaga Creek from 3,300 to 3,050 tons, and 13,616 to 13,310 tons respectively.
4. Bring 6,200 acres of forest land under management.
5. Increase forest regeneration and improve quality of the stands.

6. Reduce erosion and sediment from logging roads.
7. Increase future value of sawtimber stands.
8. Reduce total gross sheet erosion on Bone-Butler-Big Hollow from 8,622 tons to 7,235 tons annually, or about 16 percent.
9. Reduce total gross sheet erosion on Oquaga Creek from 34,546 tons to 31,772 tons annually, or about 8 percent.
10. Reduce sheet erosion on inadequately treated cropland on Bone-Butler-Big Hollow from 3,312 tons to 1,925 tons annually, or about 42 percent.
11. Reduce sheet erosion on inadequately treated cropland on Oquaga Creek from 9,535 tons to 6,761 tons annually, or about 29 percent.
12. Reduce sediment concentrations at the mouth of Oquaga Creek from 146 mg/l to 143 mg/l.
13. Reduce sediment concentrations at the mouth of Bone-Butler-Big Hollow from 219 mg/l to 202 mg/l.
14. Enable landowners to better implement sound land management plans and increase efficiencies of production through land treatment measures.

This alternative alone would not meet all the objectives of the Sponsors, but would preclude the following identified impacts of the selected alternative:

1. Commit through construction of structural measures 1 acre of cropland, 4 acres of pasture, 18 acres of open land formerly cropped, 3 acres of forest land, 2 acres of urban land, 3 acres of water, 2 acres of other land, and 900 feet of intermittent stream.
2. Create the normal inconveniences of noise and dust pollution from construction equipment, and the need for detours around construction areas.
3. Create a short term increase of sediment delivered to 3,800 feet of stream with rough fish species and the Delaware sport fishery.

4. Cause the relocation of 1,200 feet of road.
5. Decrease browse on 10 acres by converting open land formerly cropped to permanent grassland.
6. Decrease songbird habitat.
7. Change 2 acres of urban habitat to 1 acre of concrete channel and 1 acre of grass.
8. Eliminate 2 acres of gray squirrel habitat.
9. Eliminate woody vegetation on 4 acres and decrease nesting areas for some birds.
10. Decrease suitability for ground nesting species on 1 acre of forest land and 8 acres of open land formerly cropped through temporary inundation.

LAND TREATMENT AND FOUR FLOODWATER RETARDING STRUCTURES

This alternative consists of accelerated land treatment; four floodwater retarding structures (one each on Bone Creek, Big Hollow Creek, Butler Brook, and Palmer Pond), with no permanent water stored.

This alternative has an estimated cost of \$3,083,000 and would cause the following impacts:

1. Reduce floodwater damages in the village of Deposit from floods up to the magnitude of the 100-year frequency event by 66 percent.
2. Benefit directly through flood prevention about 600 people (167 houses), and owners, operators, and employees of 32 businesses.
3. Reduce development costs on 25 acres of cropland and pasture in the village of Deposit to be zoned for future urban development.
4. Reduce streambank erosion by over 60 tons annually.
5. Reduce bedload movement in Bone Creek by 50 percent.
6. Trap over 500 tons of sediment annually behind structures.

7. Commit 10 acres of cropland, 30 acres pasture, 30 acres of forest land, 22 acres of open land formerly cropped, and 3 acres of water.
8. Relocate 1 mile of road.
9. Eliminate 6,600 feet of intermittent or low flow stream containing no sport fishery.
10. Eliminate 2 acres of cropland, 14 acres of pasture, 15 acres of hardwood forest, and 8 acres of open land formerly cropped.
11. Create 21 acres of water and 18 acres of permanent grass.
12. The change in cover types will reduce woody habitat for squirrels, deer and grouse by 15 acres. Browse and woody cover will also decrease on 9 acres. Forage and grass cover for ground nesting species will increase on 19 acres. Permanent waterfowl habitat will increase by 21 acres with temporary habitat increasing by 69 acres.
13. Suitable habitat for cold water fisheries and warm water fisheries will increase by 2 acres and 19 acres, respectively.
14. Inundate temporarily 9 acres cropland, 16 acres pasture, 18 acres forest and 26 acres open land formerly cropped, reducing yields and suitability for ground nesting wildlife.
15. Provide incidental recreation in the amount of 1,575 user days annually.
16. Decrease floodflows and sediment delivered to 3,800 feet of stream with rough fish species.
17. Create the normal inconveniences of noise and dust pollution from construction equipment, and the need for detours around construction areas.
18. Create a short term increase of sediment delivered to 3,800 feet of stream with rough fish species and the Delaware sport fishery.
19. Create approximately 16 man-years of labor through construction of structural measures.

8. Three acres of urban land will be disturbed and re-vegetated with grass and shrubs.
9. Create 3 acres of grass, and 1 acre of rock-lined channel.
10. Cover changes will reduce forest cover for squirrels, whitetailed deer, and grouse by 1 acre.
11. Forage and grass cover will increase on 6 acres.
12. Fruit producing shrubs will increase songbird foods in the urban area.
13. Temporary inundation of 2 acres forest and 8 acres open land formerly cropped will decrease the habitat suitability for terrestial species while increasing values for aquatic species.
14. Provide incidental recreation in the amount of 225 user days annually.
15. Create approximately 16 man-years of labor through construction of structural measures.
16. Create the normal inconveniences of noise and dust pollution from construction equipment, and the need for detours around construction areas.
17. Create a short-term increase of sediment delivered to 3,800 feet of stream with rough fish species and the Delaware sport fishery.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would not meet the Sponsors' objectives. The adoption of this alternative alone would preclude the following identified impacts of the selected alternative.

1. Cause the relocation of 1,200 feet of road.
2. Eliminate woody vegetation on 4 acres and decrease nesting areas for some birds.
3. Commit 2 acres of other land and 4 acres of open land formerly cropped for construction of dikes.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would not meet the Sponsors' objectives. The adoption of this alternative alone would preclude the following identified impacts of the selected alternative.

1. Change 2 acres of urban habitat to 1 acre of concrete channel and 1 acre of grass.
2. Eliminate woody vegetation on 4 acres and decrease nesting areas for some birds.
3. Commit 2 acres of other land and 4 acres of open land formerly cropped for construction of dikes.

LAND TREATMENT, DEBRIS BASIN, ONE FLOODWATER RETARDING STRUCTURE, AND CHANNEL WORK

This alternative consists of accelerated land treatment; a debris basin and channel work on Bone Creek; one floodwater retarding structure on Palmer Pond, with no permanent water stored; and channel work on Butler Brook and Big Hollow Creek.

This alternative has an estimated cost of \$2,185,000 and would cause the following impacts.

1. Reduce floodwater damages in the village of Deposit from floods up to the magnitude of the 100-year frequency event by 72 percent.
2. Benefit directly through flood prevention about 600 people (167 houses), and owners, operators, and employees of 32 businesses.
3. Reduce bedload movement in Bone Creek.
4. Reduce streambank erosion by 60 tons annually.
5. Commit 3 acres of woods, 10 acres open land formerly cropped, 4 acres urban land, and 3 acres of water.
6. Eliminate 300 feet of intermittent stream not containing a sport fishery.
7. Eliminate 1 acre of hardwood forest, 2 acres of open land formerly cropped, and 1 acre of urban land.

LAND TREATMENT, THREE FLOODWATER RETARDING STRUCTURES, AND CHANNEL WORK

This alternative consists of accelerated land treatment; three floodwater retarding structures (Bone Creek, Butler Brook, and Palmer Pond), with no permanent water stored; and channel work on Bone Creek, Butler Brook and Big Hollow Creek.

This alternative has an estimated cost of \$2,444,000 and would cause the following impacts.

1. Reduce floodwater damages in the village of Deposit from floods up to the magnitude of the 100-year frequency event by 80 percent.
2. Benefit directly through flood prevention about 600 people (167 houses), and owners, operators, and employees of 32 businesses.
3. Reduce development costs on 25 acres of cropland and pasture in the village of Deposit to be zoned for future urban development.
4. Reduce streambank erosion by 60 tons annually.
5. Reduce bedload movement in Bone Creek by 50 percent.
6. Trap over 500 tons of sediment annually behind structures.
7. Commit 10 acres cropland, 30 acres pasture, 6 acres forest, 12 acres cropland formerly cropped, 4 acres urban land, and 3 acres water.
8. Relocate 1 mile of road.
9. Eliminate 3,000 feet of intermittent or low flowing stream not containing a sport fishery.
10. Eliminate 2 acres of cropland, 14 acres pasture, 2 acres hardwood forest, 6 acres of open land formerly cropped, 1 acre urban land.
11. Three acres of urban land will be disturbed and revegetated with grass and shrubs.
12. Create 12 acres of water, 12 acres permanent grass, and 1 acre rock-lined channel.

13. Cover changes will decrease woody cover used by deer squirrels and ruffed grouse and increase forage and grass nesting cover for deer, rabbits, and songbirds.
14. Habitat for warm water fish and cold water fish will increase by 10 acres and 2 acres, respectively.
15. Increase permanent waterfowl habitat by 12 acres and temporary habitat by 34 acres.
16. Temporary inundation of 9 acres of cropland, 16 acres pasture, 1 acre of forest, and 8 acres open land formerly cropped will decrease yields and suitability for terrestrial wildlife and provide temporary aquatic value.
17. Provide incidental recreation in the amount of 900 user day annually.
18. Decrease floodflows and sediment delivered to 3,800 feet of stream with rough fish species.
19. Create approximately 16 man-years of labor through construction of structural measures.
20. Create the normal inconveniences of noise and dust pollution from construction equipment, and the need for detours around construction areas.
21. Create a short-term increase of sediment delivered to 3,800 feet of stream with rough fish species and the Delaware sport fishery.
22. Cause the relocation of 1,200 feet of road.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would not meet the Sponsors' objectives. The adoption of this alternative alone would preclude the following identified impacts of the selected alternative.

1. Eliminate woody vegetation on 4 acres and decrease nesting areas for some birds.
2. Commit 2 acres of other land and 4 acres of open land formerly cropped for construction of dikes.

LAND TREATMENT; TROUT STREAM IMPROVEMENT (EQ)

This alternative consists of accelerated land treatment and trout stream improvement measures along Oquaga Creek. Environmental quality would be enhanced through the installation of this alternative, in that it relates to two of the Sponsors' goals, namely: reduce erosion throughout the watershed; and enhance existing quality and quantity of stream fishery.

This alternative has an estimated cost of a minimum of \$847,620, exclusive of landrights, and would cause the following impacts.

1. Stabilize 3,445 feet of streambank.
2. Decrease streambank erosion by approximately 450 tons per year.
3. Reduce sediment delivered to the stream by approximately 400 tons per year.
4. Reduce sediment concentration by 4 percent to 139 milligrams per liter.
5. Decrease stream braiding.
6. Eliminate livestock degradation of vegetative cover and bank stability on 29,450 feet of stream.
7. Provide approximately 34,000 feet of additional shade cover.
8. Decrease water temperature.
9. Decrease populations of rough fish species.
10. Increase numbers of trout.
11. Increase the growth rate of trout.
12. Increase number of large trout.
13. Increase the percent of stream in pools to a minimum of 35 percent.
14. Provide an additional estimated .500 fisherman days annually valued at \$5.00 each.

15. Create approximately 8.7 man-years of labor through construction of structural measures.

The land treatment would be the same as that discussed under "Land Treatment." The same costs and effects would be applicable. This alternative would not meet the Sponsors' major objective of flood control. The adoption of this alternative would preclude all impacts of the selected alternative except those related to land treatment and construction activities. A comparison of this environmental quality alternative and the selected plan is outlined in Appendix B. It should be noted that limited local financial resources prevented further consideration of the proposed trout stream improvement.

NO PROJECT ALTERNATIVE

The "do nothing" approach will not make any changes in the existing environment. The watershed would remain essentially as outlined in the "Physical Resources - Environmental Setting" section of this report. It will still be plagued with the problems which led to the initiation of this investigation; however, the Soil Conservation Service's ongoing programs will continue. Flood damage reduction and secondary benefits will be foregone. Net average annual monetary benefits foregone would total \$7,225.

SHORT TERM VS. LONG TERM USE OF RESOURCES

The most obvious trend in land use change is that of open land formerly cropped and pastureland being converted to cropland. The following table summarizes the present and expected future land use (2000). Anticipated future land use will not be influenced by installation of the project.

TABLE N - PRESENT AND FUTURE LAND USE (2000)

Land Use	Present Use		Future Use	
	(Acres)	(Percent)	(Acres)	(Percent)
Cropland	5,920	12	5,204	11
Open Land Formerly Cropped	1,586	3	356	1
Pastureland	4,412	9	2,287	5
Forest Land	35,400	74	39,121	81
Urban Land	369	1	595	1
Other Land	531	1	584	1
Water	219	0	290	0
 TOTAL	 48,437	 100	 48,437	 100

Structural measure installation will restrict options for future use on land to be occupied by the dams, channels, and dikes, or about .07 percent of the watershed. On the remaining 99.93 percent, opportunities for productive use will be maintained or enhanced.

This project is designed to meet the immediate need for flood prevention and to continue to satisfy the need, with adequate maintenance, for at least 100 years'. The plan is compatible with the long term uses of the natural resources, and will mesh readily with known water and related land resource plans of a wider scope.

The plan was reviewed by appropriate state and federal agencies and is compatible with other water resource projects in the region.

Accumulative effect, outside the watershed, is the reduction of sediment delivered to the mouth of the watershed by 1,049 tons annually.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The structural measures will occupy approximately 33 acres of land, consisting of 1 acre of cropland, 4 acres of pasture, 18 acres of open land formerly cropped, 3 acres of forest land, 2 acres of urban land, 3 acres of water, 2 acres of other land; and 900 feet of intermittent stream.

Other commitment of resources includes labor, materials, and energy required for the construction of the project.

Commitment of the land and water areas to features of the project will preclude these areas from other uses for a period to exceed the life of the project. The storage volume in the reservoirs allocated to sediment will be filled during the life of the project. However, the structures will be operational for flood reduction for many years.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

GENERAL

The Sponsoring Local Organizations and the Soil Conservation Service encourages the participation of interested public agencies and the general public in the planning process by keeping them informed of planning progress and providing them with forums to discuss their respective concerns. The diverse interests expressed by the public agencies and private citizens are considered in the formulation of the project.

The County of Broome, the Delaware County Board of Supervisors, the Broome County Soil and Water Conservation District, and the Delaware County Soil and Water Conservation District, filed an application for assistance under P.L. 566 in June 1971. The Division of Water Resources, New York State Conservation Department, approved the application in August 1971. The Soil Conservation Service Administrator authorized planning in October 1972.

Periodic meetings were held between 1972 and May 1975. Beginning in June 1975, representatives of the Soil Conservation Service met with the Steering Committee, the Environmental Review Committee, the Sponsoring Local Organizations, and interested persons on a monthly basis through May 1976. Meetings were held both in Deposit and Binghamton. Many of the meetings were open to the public and both notices of these meetings and summaries of the proceedings appeared in the weekly newspaper, "The Deposit Courier."

The Steering Committee, the Environmental Review Committee, and the Sponsoring Local Organizations were fully involved in the decisionmaking necessary during project formulation. Several alternatives were evaluated during planning in order to determine a feasible plan acceptable to the Sponsors. Representatives of the Soil Conservation Service presented physical and economic data relative to these alternatives to the Sponsors and other interested agencies, groups, and individuals as they were developed.

Included in these presentations were two field trips through the watershed with the Environmental Review Committee and the Sponsors to view and discuss problems and alternatives toward their solution.

A number of coordination meetings involving representatives from the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, and the Soil Conservation Service were held during project formulation to assess potential environmental issues.

The planning of this watershed has been coordinated with the New York State Office of Parks and Recreation regarding historical and archeological investigations. The National Register of Historic Places was reviewed to confirm that no properties in the watershed were listed which are significant in American history, architecture, archeology, or culture. Qualified members of the Environmental Review Committee inspected the area to determine impacts on any cultural resources.

Personnel of the U.S. Fish and Wildlife Service, U.S. Department of the Interior, and the New York State Department of Environmental Conservation have made several reconnaissances of the project area with Soil Conservation Service personnel to coordinate the fish and wildlife aspects of the project. The U.S. Geological Survey, U.S. Department of the Interior, has provided an assessment of water quality and advised Soil Conservation Service personnel during project formulation.

The following agencies were asked to comment on the draft statement:

Department of the Army
Department of Commerce
Department of Health, Education, and Welfare
Department of the Interior
Department of Transportation
Office of Equal Opportunity - USDA
Environmental Protection Agency
Advisory Council on Historic Preservation
Federal Power Commission
Appalachian Regional Commission
Delaware River Basin Commission

New York State Department of Environmental Conservation
New York State Office of Planning Services
Southern Tier East Regional Planning and Development Board
National Audubon Society
Natural Resources Defense Council
International Joint Committee
Friends of the Earth
Environmental Defense Funds
National Wildlife Federation
Water Resources Council
Broome County Planning Board
Broome County Environmental Review Committee
Delaware County Planning Board

**DISCUSSION AND DISPOSITION OF EACH COMMENT
ON DRAFT ENVIRONMENTAL STATEMENT**

No response was received during the review of the draft Environmental Impact Statement from the following agencies:

Department of Commerce
Department of Transportation
Federal Power Commission
Appalachian Regional Commission
New York State Office of Planning Services
Southern Tier East Regional Planning and Development Board
National Audubon Society
Natural Resources Defense Council
International Joint Committee
Friends of the Earth
Environmental Defense Fund
National Wildlife Federation
Water Resources Council
Broome Co. Planning Board
Delaware Co. Planning Board

Comments were received from the following:

Department of the Army
Department of Health, Education, and Welfare
Department of the Interior
Office of Equal Opportunity - USDA
Environmental Protection Agency
Advisory Council on Historic Preservation
Delaware River Basin Commission
New York State Department of Environmental Conservation
New York State Department of Agriculture and Markets
Broome County Historical Society
Broome County Environmental Management Council
Broome County Environmental Review Committee

Each issue, problem, or objection is summarized and a response given on the following pages. Comments are serially numbered where agencies have supplied multiple comments. The original letters of comment appear in Appendix C.

DEPARTMENT OF THE ARMY

(1) Comment: Philadelphia District has reviewed the Deposit Watershed Plan and Environmental Impact Statement which had been forwarded to this office for review and comment.

The proposals in the EIS do not conflict with the New York Tributaries Studies being conducted by our office.

Response: Noted

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

(1) Comment: The projected recreational uses of the watershed may require some planning for sanitary and solid waste disposal. Septic systems and/or alternatives should be addressed. The proposed floodwater retention structures may require additional study.

Response: There is no storage specifically provided for recreational use. The words "from concentrations of litter and human waste", were added to the narrative. (See pages P-5 and E-11). During the formulation and planning stage, the capabilities of the structures for recreation were presented to the sponsors. Due to site limitations, plus the construction of Oquaga Creek State Park, the sponsors chose not to plan for recreational development. Incidental use of the sites by neighboring residents is anticipated. The Soil Conservation Service has informed the sponsors that they must provide controls and sanitary facilities required by New York State Health codes so as not to degrade the environment.

(2) Comment: The watershed contains extensive agricultural activities. Pesticides and other toxic material may concentrate in the retention pond sediments only to be scoured or dredged and redeposited at a later date.

Response: Approximately 12 percent of the total land use in the watershed is devoted to agricultural activity (cropland) which would require the use of pesticides and/or herbicides. Cultivated land in the drainage area behind the Bone Creek structure occupies approximately 25 percent, whereas there

is no cultivated land in the drainage behind Palmers Pond. This would indicate that extensive agricultural activities do not exist in many portions of the watershed, particularly in the drainage areas behind the floodwater retarding structures. Also, sediment accumulation for each structure has been calculated for the 100 year life of the project and appropriate space provided in the design for this sediment. Therefore, there is no anticipated dredging of sediment during project life.

UNITED STATES DEPARTMENT OF THE INTERIOR

(1) Comment: The possible need for permits from the Corps of Engineers to conduct dredge and fill activities and to construct dams and dikes in project implementation should be discussed in the final statement. Accordingly, the comments on these documents do not in any way preclude additional and separate evaluation and comments by our Fish and Wildlife Service, under the Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), if project implementation requires a permit.

In review of the application for such permits, the Fish and Wildlife Service may concur with or without stipulations, or object to the proposed work depending on project effects which may be identified and evident at that time on fish and wildlife resources. It would appear that the Fish and Wildlife Service, at a minimum, will probably recommend that the Corps of Engineers when issuing a permit require (1) features to reduce turbidity during project construction, (2) the channeled area be stabilized with plantings suitable for wildlife utilization, and (3) such other measures as would be apparent and appropriate from the information available at the time.

Response: Application for permits from the Corps of Engineers will be filed for those structural measures requiring permits at the time of application.

Features discussed under (1), (2), and (3) are normally included in construction contracts.

(2) Comments: The final environmental statement should include a display and discussion of commentaries from the State Historic Preservation Officer and State Archaeologist to substantiate the negative reports men-

tioned on page E-31. While it is essential to provide backup mitigation for potential adverse effects to archeological values, we encourage more detailed site investigation prior to construction operations. Such efforts could greatly reduce or avoid inadvertent loss or damage to archaeological resources and unanticipated disruption to progress schedules. The final environmental statement could also be more descriptive in presenting a detailed systematic contingency plan for the protection of archeological values should any be found prior to as well as during construction.

Response: Comments from the State Historic Preservation Officer will be made a part of the final EIS. The purpose of this inclusion is for information only and no discussion is anticipated. Other comment responses fully explain the timing of the proposed detailed surveys of construction areas.

(3) **Comment:** Land treatment measures will include subsurface drainage, disposal lagoon construction, and agricultural waste management (DEIS, page E-5); effects of these measures on groundwater levels and quality should be assessed.

Response: Land treatment measures such as subsurface drainage disposal lagoons, and agricultural waste management will not materially affect the groundwater levels. Subsurface drainage and disposal lagoons will have little effect on groundwater quality. Agricultural waste management will improve groundwater quality as planned application rates of waste will enable nutrients to be recycled through harvested crops.

UNITED STATES DEPARTMENT OF AGRICULTURE - OFFICE OF EQUAL OPPORTUNITY, WASHINGTON, D.C. 20250

(1) **Comment:** The Draft Watershed Plan and Draft Environmental Impact Statement (EIS) for the Deposit Watershed were reviewed by this office for the purpose of assessing the socio-economic impact of the project on minority groups living in or near the affected area.

It does not appear that the proposed project will adversely affect the civil rights of minorities residing in the affected areas (2.0 percent in

Broome County, .9 percent in Chenango County, and 1.0 percent in Delaware County).

Response: Noted

ENVIRONMENTAL PROTECTION AGENCY - REGION II

(1) Comment: Since the proposed project requires the taking of two acres of urban land for the diversion channel and dikes, the final EIS should discuss the number of families that would be displaced by this action.

Response: The urban land that will be taken is land only and does not include any residences. No displacement or relocation of any person or businesses is anticipated. See P-18, footnote 1/.

(2) Comment: According to the draft EIS, the public would be refused access to the project works to prevent unsanitary conditions. The final EIS should specify what unsanitary conditions are being referred to. Since multiple use of facilities is normally incorporated into this type of project and since the cost of the project will be incurred by the public, we feel that stronger consideration should be given to recreational land uses.

Response: There is no storage provided for recreational use. The words "from concentrations of litter and human waste" were added to the narrative. (See pages P-5 and E-11). During the formulation and planning phase, the capabilities of the structures for recreation was presented to the sponsors. Due to site limitations, plus the construction of Oquaga Creek State Park, the sponsors chose not to plan for recreational development. Incidental use of the sites by neighboring residents is anticipated. The Soil Conservation Service has informed the sponsors that they must provide controls and sanitary facilities required by New York State Health codes to prevent degradation of the environment.

(3) Comment: We note that the proposed project's cost/benefit (C/B) ratio is only 1.2, and that if the reduced development cost factor is deleted, the C/B ratio falls to about 1.1. Considering the uncertainties of predicting damage reduction and costs, it would appear very difficult to justify a project

with such a low C/B ratio. However, the low C/B ratio could be considerably improved if provisions were made for recreational facilities.

Response: Noted

(4) Comment: According to EPA procedures, we have rated the draft EIS as LO-1, indicating our lack of objection to the project as proposed (LO) and that the draft EIS adequately sets forth the environmental impact of the proposed project and its alternatives (1). One copy of the final EIS is requested for subsequent review.

Response: One copy of the final EIS will be furnished to your office as requested.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

(1) Comment: In our review of the draft statement, we note that you have followed the Council's "Procedures for the Protection of Historic and Cultural Properties" for identifying properties included or eligible for inclusion in the National Register of Historic Places and have concluded that none exist within the potential environmental impact areas of your project.

Response: Noted

(2) Comment: However, supplementing the data compiled on pp. 6-30 and 6-31, the final environmental impact statement should include further documentation of the review of archeological resources carried out by the Director, Public Archeology Facility, SUNY at Binghamton and the Broome County Environmental Review Committee.

Response: See Appendix J.

(3) Comment: Also required is an explanation of the site walk-over carried out by the SCS technician. Professional qualifications of all parties should be referenced.

Response: An SCS technician (Senior Staff Geologist) walked over all of the land area that will be disturbed when construction is carried out on this project. This was intended only to reveal the existence of any obvious surficial remains.

(4) Comment: The comments of the State Historic Preservation Officer should also be incorporated into the final environmental statement.

Response: See Appendix J.

DELAWARE RIVER BASIN COMMISSION

(1) Comment: We have completed our review of the Deposit Watershed Plan and Environmental Impact Statement draft as requested in your letters of May 3, and June 3, 1977. We have no comments or suggestions for change.

Response: Noted

(2) Comment: In accordance with item 6 of the Administrative Agreement between the Delaware River Basin Commission and the Soil Conservation Service, we look forward to receipt of the final Work Plan for inclusion by the DRBC in its Comprehensive Plan. A copy of the Commission's Rules of Practice and Procedure is enclosed for your reference.

Response: A copy of the final Plan and EIS will be furnished to your office as requested.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
OFFICE OF REGIONAL OPERATIONS, WATER MANAGEMENT GROUP

(1) Comment: The Draft Watershed Plan for the Deposit Watershed has been reviewed by the following State agencies:

Department of Commerce
Department of Transportation
Department of Agriculture and Markets
Department of Health
Division of State Planning
Office of Parks and Recreation
Department of Environmental Conservation

The agencies generally agreed that the project would be most beneficial.

Response: Noted

(2) Comment: Project Development Bureau, NYS Department of Transportation--indicated that a permit will be

required for any work which is to be done on State highway right-of-way. Reference was made to the culvert which passes under Route 10.

Response: A permit will be applied for and secured before any construction can take place on that structural measure.

(3) Comment: Page p-26, Table 3 - Structural Data - Capacity Equivalents--what is the reason for the Palmer Pond floodwater retarding volume of three inches and the Bone Creek volume only 0.51 inches.

Response: The Palmer Pond Dam is a floodwater retarding structure which significantly reduces the flow. The Bone Creek Dam is a debris basin with some planned storage to limit the flow.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
OFFICE OF ENVIRONMENTAL ANALYSIS

(1) Comment: We have reviewed the above noted document and believe that, in general, the statement adequately discusses the potential impacts of the proposed project.

Response: Noted

(2) Comment: Our major concern is the control of turbidity and sedimentation during project construction. We request review of project plans specifying temporary pollution control measures during construction before such plans are finalized. Please forward this information to our regional office when it becomes available.

Response: Copies of the project plans will be forwarded to your office as requested.

(3) Comment: Thank you for the opportunity to review this statement. We would like to receive four copies of the Final Environmental Impact Statement when it is available.

Response: Four copies of the final Plan and EIS will be forwarded to your office as requested.

NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS

(1) Comment: Soil Conservation Service's Draft Watershed Plan and EIS on the Deposit Watershed has been reviewed and the proposal should be most beneficial.

Response: Noted

(2) Comment: The area has a history of recurrent flooding and has incurred substantial economic and environmental losses due to periodic flooding. Therefore, the loss of one acre to cropland and four acres of pasture is certainly minimal to the overall savings in stabilizing the 48,437 acre watershed.

Response: Noted

(3) Comment: The two channelized areas should not have an adverse impact on viable agricultural land. The Bone Creek Channel is in the village of Deposit and represents only rehabilitation work. The Elm Street diversion, in which 700 feet of new channel work is being constructed appears to be urban in nature.

Response: Noted

(4) Comment: The impact on viable agricultural farmland is expected to be minimal and the proposal seems to represent the best available technology for abating the flooding of the Deposit Watershed. No further comment is necessary at this time.

Response: Noted

BROOME COUNTY HISTORICAL SOCIETY

(1) Comment: The Broome County Historical Society is concerned that the proposed plans will cause an adverse impact on the cultural resources of the area.

The approximately 30 acres to be committed to the installation of structural measures in addition to the borrow areas needed to obtain fill to construct the floodwater retarding structures indicates a considerable amount of planned earthmoving. Earth moving frequently produces an adverse impact on cultural resources.

Based on culture resource surveys and inventories in other parts of Broome, Chenango and Delaware Counties it is likely that there are prehistoric and historic sites that may be impacted by the proposed construction.

Has a thorough literature search for reported cultural resources been undertaken? Have the land areas to be disturbed been systematically subsurfaced tested by qualified archeologists?

Response: A literature search was undertaken with negative results. The land areas to be disturbed will be systematically tested by a competent archeologist prior to any disturbance of that land area.

(2) Comment: Map I-1 (Map of Historic Places) was not included in the copy of the report that I received. Therefore I cannot comment on the adequacy of the report. I know that historical documents report that the village of Deposit was built on an 18th century Indian village called Cookose or Cookhouse. Little is known of the Indians who lived there but remains of their occupation must still exist in the village.

Response: Initial copies of the Draft Plan and EIS were inadvertently missing the Map of Historic Places. However, the map indicated only the location of those two properties listed in the Historic American Buildings Survey, namely the Edick Conrad House on River Street, and the Palmerton House on 2nd Street. No Indian village locations are shown.

(3) Comment: The negative information concerning cultural resources reported on page E-31 is not sufficient to conclude that there are no cultural resources in the project areas. Sites related to the first approximately 10,000 years of human occupation are buried beneath the ground surface. Only systematic survey with subsurface testing (e.g. shovel test pitting) can locate these resources. The project areas have never been tested to my knowledge.

Response: The land areas within the project that will be disturbed during construction will be surveyed prior to any construction.

(4) Comment: Page P-5 states that "Construction will not begin or continue until appropriate arrangements for survey or salvage have been made." Can you tell me how these arrangements are to be made? A pre-construction survey is essential. An adequate survey in the early planning stage of a project should identify those significant cultural resources that would be impacted. Salvage of identified resources is a last resort, only to be undertaken when a project cannot be redesigned to avoid adverse impact.

Ideally, no unknown cultural resources should appear after the start of construction. Salvage at this point is expensive both monetarily to the project and historically for the loss of information that a hurried salvage excavation may incur.

Without detailed project plan I cannot estimate the cost of an adequate cultural resource survey but it would be far less than 1 percent of the total project cost - a small price to pay for our unrenewable cultural (prehistoric and historic) resources.

Response: Soon after final approval of the plan by all concerned parties, and evidence that construction is going to proceed, a contract will be let for an archeological survey of all the disturbed areas.

BROOME COUNTY ENVIRONMENTAL MANAGEMENT COUNCIL

(1) Comment: Over the past two years, the Broome County Environmental Management Council and staff have been working closely with U.S.D.A. Soil Conservation Service and concerned citizens in developing a plan for flood protection in the Deposit, New York area. The Council has reviewed the Draft Watershed Plan and Environmental Impact Statement for the Deposit Watershed and accept this document.

The Council finds no significant adverse environmental impacts--indeed, this project, as presented,

should improve the natural and social environments of the Village and its environs. Thus, the Council accepts this draft plan and environmental impact statement.

Response: Noted

BROOME COUNTY ENVIRONMENTAL REVIEW COMMITTEE

(1) Comment: We see no great potential for adverse impact. Certainly any undertaking on the land will result in change, but we recognize that change is not always bad. In this case we feel that change will be to the benefit of the environment if the plans outlined in the proposal are followed.

Response: Noted

(2) Comment: We wish to express our gratitude that our recommendations have been incorporated in the plan.

Response: Noted

(3) Comment: Finally we urge immediate implementation of the Watershed Plan.

Response: Noted

Soil Conservation Service
United States Department of Agriculture

Approved by:

Robert L. Hilliard
State Conservationist

Date

APPENDIX A

APPENDIX A

SELECTED PLAN

Deposit Watershed, New York

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u> (Average Annual) <u>1/</u>
Beneficial effects:	
A. The value to users of increased outputs of goods and services	
1. Flood prevention	
Damage Reduction	\$73,370
Indirect Damage	6,890
2. Changed Land Use	
Urban	9,325
3. Employment	9,900
TOTAL BENEFICIAL EFFECTS	\$99,485

1/ 100 years @ 6-3/8 percent interest

SELECTED PLAN

Deposit Watershed, New York

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u> (Average Annual) <u>1/</u>
Adverse Effects:	
A. The value of resources required for a plan:	
Project installation	\$ 79,510
Project operation and maintenance	2,200
Project administration	10,550
TOTAL ADVERSE EFFECTS	\$92,260
NET BENEFICIAL EFFECTS	7,225

1/ 100 years @ 6-3/8 percent interest

SELECTED PLAN

Deposit Watershed, New York

ENVIRONMENTAL QUALITY ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>
Beneficial and adverse effects:	
A. Areas of natural beauty	<ol style="list-style-type: none">1. The project will commit 2 acres urban land, 1 acre cropland, 3 acres forest, 4 acres of pasture, 18 acres open land formerly cropped, and 900 feet of intermittent stream through installation of structures.
	<ol style="list-style-type: none"><li value="2">2. Decrease floodflows and sediment to 3,800 feet of stream.

SELECTED PLAN

Deposit Watershed, New York

ENVIRONMENTAL QUALITY ACCOUNT

ComponentsMeasures of Effects

Beneficial and adverse effects:

B. Quality considerations of water, land, and air resources.

1. Reduce 98 percent of floodwater damage from floods up to the magnitude of the 100-year frequency event in the village of Deposit.
2. Benefit directly about 640 residents and owners, operators, and employees of 32 businesses.
3. Relocate 1,200 feet of road.
4. Reduce bedload deposition.
5. During project installation period will increase the sediment delivered to 3,800 feet of stream.
6. Four acres of pasture will be permanent grassland.
7. Marsh Creek dike will decrease the amount of animal waste and debris delivered to the trout fishery of Oquaga Creek.
8. Marsh Creek will reduce damage of Route 41 and bridge at Route 41 by eliminating debris.
9. Land treatment will reduce erosion and sediment.

SELECTED PLAN

Deposit Watershed, New York

ENVIRONMENTAL QUALITY ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>
Beneficial and adverse effects:	<ol style="list-style-type: none">1. Increase forage on 6 acres for deer and rabbits and decrease browse.
C. Biological resources and selected ecosystems.	<ol style="list-style-type: none">2. Eliminate 2 acres of gray squirrel habitat.3. Create 2 acres of water suitable for trout and waterfowl use.4. Inundate temporarily 8 acres open land formerly cropped and 1 acre forest land, thereby decreasing suitability for ground nesting species and increasing habitat for migrating waterfowl.5. Change 2 acres of urban habitat to 1 acre of concrete channel and 1 acre of grass.6. Increase nesting habitat for ground nesting birds and mammals.7. Decrease quality of habitat in 3,800 feet of stream used by rough fish.

SELECTED PLAN

Deposit Watershed, New York

ENVIRONMENTAL QUALITY ACCOUNT

Components

Beneficial and adverse effects:

D. Irreversible or irretrievable commitments.

1. The installation will commit land labor and capital to the project.
2. The installation will disturb 115,400 cubic yards of earth and rock from its natural state.

Measures of Effects

SELECTED PLAN

Deposit Watershed, New York

REGIONAL DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>	
	<u>State of New York</u>	<u>Rest of Nation</u>
Income:		
Beneficial effects:	(Average Annual)	<u>1/</u>
A. The value of increased output of goods and services to users residing in the region.		
1. Flood Prevention		
Damage Reduction	\$73,370	None
Indirect Damage	6,890	
2. Changed Land Use		
Urban	\$ 9,325	
3. Employment		
	\$ 9,900	
TOTAL BENEFICIAL EFFECTS	\$99,485	None
<u>1/ 100 years @ 6-3/8 percent interest</u>		

SELECTED PLAN

Deposit Watershed, New York

REGIONAL DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>	
	<u>State of New York</u>	<u>Rest of Nation</u>
Income:		
Adverse effects:	(Average Annual) <u>1/</u>	
A. The value of resources contributed from within the region to achieve the outputs.		
1. Project installation	\$ 4,840	\$ 74,670
2. Project operation and maintenance	2,200	
3. Project administration		10,550
B. Losses of output resulting from external diseconomies to users residing in the region.		
C. Loss of assistance payments from sources outside the region to otherwise unemployed or under-employed resources.		
TOTAL ADVERSE EFFECTS	\$ 7,040	\$ 85,220
NET BENEFICIAL EFFECTS	\$92,445	\$-85,220

1/ 100 years @ 6-3/8 percent interest

SELECTED PLAN

Deposit Watershed, New York

REGIONAL DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>	
	<u>State of New York</u>	<u>Rest of Nation</u>
Employment		

Beneficial effects:

A. Increase in the number and types of jobs

1. Project construction
 - Create during project installation period
8 man-years of skilled labor
8 man-years of unskilled labor annually
2. Project OEM
 - Create during project evaluation
0.15 man-year of unskilled labor

During project installation period
16 man-years of labor

During project evaluation period
0.15 man-years of labor

TOTAL BENEFICIAL EFFECTS

SELECTED PLAN

Deposit Watershed, New York

REGIONAL DEVELOPMENT ACCOUNT

A-10

<u>Component</u>	<u>Measures of Effects</u>	<u>State of New York</u>	<u>Rest of Nation</u>
Employment:			
Adverse effects:			
A. Decrease in number and types of jobs.	None	None	None
Total adverse effects			
			During project installation period 16 man-years labor
			During project evaluation period 0.15 man-years of labor
			None
			Net beneficial effects

SELECTED PLAN

Deposit Watershed, New York

REGIONAL DEVELOPMENT ACCOUNT

<u>Components</u>	<u>Measures of Effects</u>	
	<u>State of New York</u>	<u>Rest of Nation</u>
Population Distribution		
Beneficial and adverse effects	None	None
Regional Economic Base and Stability		
Beneficial and adverse effects	16 years of employment over a 5 year construction period will be created and 0.15 man-years of permanent employ- ment will be created	
Environmental Conditions of Special Regional Concern		
Beneficial and adverse effects	None	None

SELECTED PLAN

Deposit Watershed, New York

SOCIAL WELL-BEING ACCOUNT

ComponentsMeasures of effects

Beneficial and adverse effects:

A. Real Income Distribution 1. Trace

2. Creates regional benefit distribution of \$92,445 annually by income class as follows:

<u>Income Class (Dollars)</u>	<u>Percentage of Adjusted Gross Income in Class</u>	<u>Percentage Benefits in Class</u>
Less than 3,000	17	4
3,000 to 10,000	69	62
More than 10,000	14	34

3. Local cost to be borne by regional total \$7,040 annually with distribution by income class as follows:

<u>Income Class (Dollars)</u>	<u>Percentage of Adjusted Gross Income in Class</u>	<u>Percentage Contributions in Class</u>
Less than 3,000	17	4
3,000 to 10,000	69	62
More than 10,000	14	34

B. Life, Health and Safety 1. Provide 1 percent level of flood protection to village of Deposit.

C. Educational, Cultural and Recreational Opportunities 1. Provide incidental recreation in the amount of 375 user days annually.

D. Emergency Preparedness

APPENDIX B

APPENDIX B

SUMMARY COMPARISON BETWEEN PLAN A AND THE SELECTED PLAN

ACCOUNT	SELECTED PLAN	ENVIRONMENTAL QUALITY PLAN	DIFFERENCES (SELECTED PLAN MINUS ENVIRONMENTAL QUALITY PLAN)	
			Beneficial Effects	Adverse Effects
National Economic Development	99,485	3,200	96,285	
Beneficial Effects	92,260	41,200	51,060	
Adverse Effects	7,225	-38,000	45,225	
Net Beneficial Effects				
Environmental Quality				
Beneficial and Adverse Effects:				
A. Areas of Natural Beauty		The project will stabilize 12.67 miles of streambank and improve visual quality.		
B. Quality Considerations		Reduce 95 percent of floodwater damage from floods up to the magnitude of the 100-year frequency.		
of Water, Land, and Air Resources				
C. Regional Development				
State of New York				
A. Income:				
Beneficial effects	99,485	3,520	95,965	
Adverse effects	7,040	21,113	-14,073	
Net beneficial effects	92,445	-17,593	110,038	
B. Employment:				
During project construction period	16	8.7 man-years of employment	7.3 man-years of employment	
During project evaluation period	0.15	0.3 man-years of permanent employment	-0.15 man-years of permanent employment	

SUMMARY COMPARISON BETWEEN PLAN A AND THE SELECTED PLAN (cont'd)

B-2

ACCOUNT <u>Social Well-Being</u>	<u>SELECTED PLAN</u>	<u>ENVIRONMENTAL QUALITY PLAN</u>	DIFFERENCES (SELECTED PLAN MINUS ENVIRONMENTAL QUALITY)
A. Life, Health, and Safety	Provide 1 percent level of flood protection to the village of Deposit.	Provide one percent level of flood protection to the village of Deposit.	
B. Recreational Opportunities	Provide 375 user days of incidental recreation.	Provide 375 user days of incidental recreation.	Will not provide 500 user days of trout fishing.

APPENDIX C



DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO

NAPEN-E

27 JUN 1977

Robert L. Hilliard, State Conservationist
United States Department of Agriculture
Soil Conservation Service
771 Federal Building
100 S. Clinton Street
Syracuse, New York 13202

Dear Mr. Hilliard:

Philadelphia District has reviewed the Deposit Watershed Plan and Environmental Impact Statement which had been forwarded to this office for review and comment.

The proposals in the EIS do not conflict with the New York Tributaries Studies being conducted by our office.

Sincerely yours,

Worth D. Phillips
WORTH D. PHILLIPS
Chief, Engineering Division



EEB



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

JUL 13 1977

Mr. Robert L. Hilliard
State Conservationist
United States Department of Agriculture
Soil Conservation Service
771 Federal Building
100 South Clinton Street
Syracuse, New York 13202

Dear Sir:

Thank you for the opportunity to review the draft Environmental Impact Statement on the Deposit Watershed; Broome, Chenango and Delaware Counties, New York.

The projected recreational uses of the watershed may require some planning for sanitary and solid waste disposal. Septic Systems and/or alternatives should be addressed.

The proposed floodwater retention structures may require additional study.

The watershed contains extensive agricultural activities. Pesticides and other toxic material may concentrate in the retention pond sediments only to be scoured or dredged and redeposited at a later date.

Sincerely,

A handwritten signature in black ink that reads "Charles Custard".

Charles Custard
Director
Office of Environmental Affairs



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER-77/552

JUL 22 1977

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
Department of Agriculture
771 Federal Building
100 South Clinton Street
Syracuse, New York 13202

Dear Mr. Hilliard:

Thank you for your letter of June 3, 1977, requesting our views and comments on the draft watershed plan and draft environmental statement for Deposit Watershed, Broome, Chenango, and Delaware Counties, New York. Except for the comments and suggestions listed below, the documents adequately consider those areas within our jurisdiction and expertise.

The possible need for permits from the Corps of Engineers to conduct dredge and fill activities and to construct dams and dikes in project implementation should be discussed in the final statement. Accordingly, the comments on these documents do not in any way preclude additional and separate evaluation and comments by our Fish and Wildlife Service, under the Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), if project implementation requires a permit.

In review of the applications for such permits, the Fish and Wildlife Service may concur with or without stipulations, or object to the proposed work depending on project effects which may be identified and evident at that time on fish and wildlife resources. It would appear that the Fish and Wildlife Service, at a minimum, will probably recommend that the Corps of Engineers when issuing a permit require (1) features to reduce turbidity during project construction, (2) the channelized area be stabilized with plantings suitable for wildlife utilization, and (3) such other measures as would be apparent and appropriate from the information available at the time.

The final environmental statement should include a display and discussion of commentaries from the State Historic Preservation



Officer and State Archeologist to substantiate the negative reports mentioned on page E-31. While it is essential to provide backup mitigation for potential adverse effects to archeological values, we encourage more detailed site investigation prior to construction operations. Such efforts could greatly reduce or avoid inadvertent loss or damage to archeological resources and unanticipated disruption to progress schedules. The final environmental statement could also be more descriptive in presenting a detailed systematic contingency plan for the protection of archeological values should any be found prior to as well as during construction.

Land-treatment measures will include subsurface drainage, disposal lagoon construction, and agricultural waste management (DEIS, page E-5); effects of these measures on groundwater levels and quality should be assessed.

We hope these comments and suggestions will be of assistance to you.

Sincerely,



Larry E. Meierotto
Deputy Assistant SECRETARY

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY

WASHINGTON, D.C. 20250

JUN 13 1977

OFFICE OF EQUAL OPPORTUNITY

IN REPLY 8140 Supplement 8

REFER TO:

SUBJECT: Draft Watershed Plan and Environmental Impact Statement for
the Deposit Watershed, New York

TO: Robert Hilliard
State Conservationist

THRU: Verne M. Bathurst, Deputy Administrator
for Management, SCS

The Draft Watershed Plan and Draft Environmental Impact Statement (EIS) for the Deposit Watershed were reviewed by this office for the purpose of assessing the socio-economic impact of the project on minority groups living in or near the affected area.

It does not appear that the proposed project will adversely affect the civil rights of minorities residing in the affected areas (2.0 percent in Broome County, .9 percent in Chenango County and 1.0 percent in Delaware County).

Thank you for allowing us to review this environmental statement.



JAMES FRAZIER
Director



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

20 JUN 1977

Class, LO-I

Mr. Robert L. Hilliard
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
771 Federal Building
100 South Clinton Street
Syracuse, New York 13202

Dear Mr. Hilliard:

We have reviewed the draft watershed plan and environmental impact statement (EIS) for Deposit Watershed in Broome, Chenango, and Delaware Counties, New York. The proposed plan provides for construction of two floodwater retarding structures, two channels, and two dikes, and for installation of land treatment measures on 1,825 acres of cropland and 3,175 acres of forest. The following comments are offered for your consideration in preparing the final EIS.

Since the proposed project requires the taking of two acres of urban land for the diversion channel and dikes, the final EIS should discuss the number of families that would be displaced by this action.

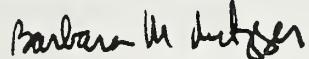
According to the draft EIS, the public would be refused access to the project works to prevent unsanitary conditions. The final EIS should specify what unsanitary conditions are being referred to. Since multiple use of facilities is normally incorporated into this type of project and since the cost of the project will be incurred by the public, we feel that stronger consideration should be given to recreational land uses.

We note that the proposed project's cost/benefit (C/B) ratio is only 1.2, and that if the reduced development cost factor is deleted, the C/B ratio falls to about 1.1. Considering the uncertainties of predicting damage reduction and costs, it would appear very difficult to justify a project with such a low C/B ratio. However, this low C/B ratio could be considerably improved if provisions were made for recreational facilities.

According to EPA procedures, we have rated the draft EIS as LO-I, indicating our lack of objection to the project as proposed (LO) and that the draft EIS adequately sets forth the environmental impact of the proposed project and its alternatives (I).

One copy of the final EIS is requested for subsequent review. If you have any questions concerning this letter, please feel free to contact this office at the above address or at FTS Telephone No. 264-8556.

Sincerely yours,



Barbara M. Metzger
Chief
Environmental Impacts Branch

HSS
EEB
Ellis will prepare
response for EIS

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

July 28, 1977

Mr. Robert L. Hillard
State Conservationist, Soil Conservation
Service
U.S. Department of Agriculture
771 Federal Building
100 S. Clinton Street
Syracuse, New York 13302

Dear Mr. Hillard:

Thank you for your request of June 3, 1977, for comments on the draft environmental impact statement for the Deposit Watershed in Broome, Chenango, and Delaware Counties. In our review of the draft statement, we note that you have followed the Council's "Procedures for the Protection of Historic and Cultural Properties" for identifying properties included or eligible for inclusion in the National Register of Historic Places and have concluded that none exist within the potential environmental impact area of your project.

However, supplementing the data compiled on pp. 6-30 and 6-31, the final environmental impact statement should include further documentation of the review of archeological resources carried out by the Director, Public Archeology Facility, SUNY at Binghamton and the Broome County Environmental Review Committee. Also required is an explanation of the site walkover carried out by the SCS technician. Professional qualifications of all parties should be referenced. The comments of the State Historic Preservation Officer should also be incorporated into the final environmental statement.

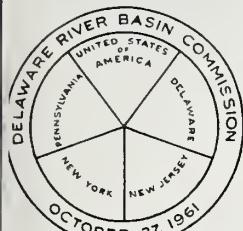
Should you have any questions, please call Amy P. Schlagel at 202-254-3380.

Sincerely yours,

Myra F. Harrison

Myra F. Harrison
Acting Director
Office of Review
and Compliance

HSS
EFB



JAMES F. WRIGHT
EXECUTIVE DIRECTOR

DELAWARE RIVER BASIN COMMISSION
P. O. BOX 7360
WEST TRENTON, NEW JERSEY 08628
(609) 883-9500

June 8, 1977

HEADQUARTERS LOCATION
25 STATE POLICE DRIVE
WEST TRENTON, N.J.

Mr. Robert L. Hilliard
State Conservationist
Soil Conservation Service
U. S. Courthouse and Federal Building
100 South Clinton St.
Room 771
Syracuse, N.Y. 13202

Dear Mr. Hilliard:

Re: D-74-27CP

We have completed our review of the Deposit Watershed Plan and Environmental Impact Statement draft as requested in your letters of May 3, and June 3, 1977. We have no comments or suggestions for change.

In accordance with item 6 of the Administrative Agreement between the Delaware River Basin Commission and the Soil Conservation Service, we look forward to receipt of the final Work Plan for inclusion by the DRBC in its Comprehensive Plan. A copy of the Commission's Rules of Practice and Procedure is enclosed for your reference.

Sincerely,

A handwritten signature in black ink, appearing to read "James F. Wright". Below the signature, the name "James F. Wright" is printed in a smaller, standard font.

Enc.

cc: Mr. Warren J. Fitzgerald,
N.J. State Conservationist

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233



Peter A. A. Berle,
Commissioner

OFFICE OF REGIONAL OPERATIONS
WATER MANAGEMENT GROUP

July 19, 1977

Mr. Robert L. Hilliard
State Conservationist
US Department of Agriculture
Soil Conservation Service
771 Federal Building
100 South Clinton Street
Syracuse, New York 13202

Dear Mr. Hilliard:

The Draft Watershed Plan for the Deposit Watershed has been reviewed by the following State agencies:

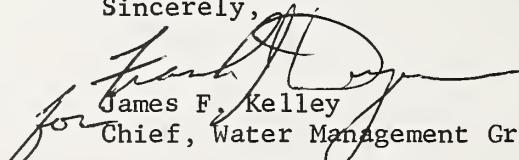
Department of Commerce
Department of Transportation
Department of Agriculture and Markets
Department of Health
Division of State Planning
Office of Parks and Recreation
Department of Environmental Conservation

The agencies generally agreed that the project would be most beneficial. Comments were as follows:

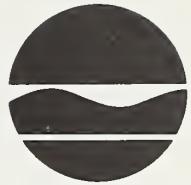
1. Project Development Bureau, NYS Department of Transportation-- indicated that a permit will be required for any work which is to be done on State highway right-of-way. Reference was made to the culvert which passes under Route 10.
2. Page P-26, Table 3 - Structural Data - Capacity Equivalents-- what is the reason for the Palmer Pond floodwater retarding volume of three inches and the Bone Creek volume only 0.51 inches.

Comments on the Environmental Impact Statement will be forwarded from this Department's Office of Environmental Analysis.

Sincerely,


James F. Kelley
Chief, Water Management Group

cc: P. Grady
TEA/ea



New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Peter A. A. Berle,
Commissioner

July 20, 1977

Mr. Robert L. Hilliard
State Conservationist
USDA Soil Conservation Service
771 Federal Building
100 South Clinton Street
Syracuse, New York 13202

Dear Mr. Hilliard:

Draft Environmental Impact Statement
Deposit Watershed
Broome, Chenango and Delaware Counties
DEC: #047-003

We have reviewed the above noted document and believe that, in general, the statement adequately discusses the potential impacts of the proposed project.

Our major concern is the control of turbidity and sedimentation during project construction. We request review of project plans specifying temporary pollution control measures during construction before such plans are finalized. Please forward this information to our regional offices (addresses below) when it becomes available.

Thank you for the opportunity to review this statement. We would like to receive four copies of the Final Environmental Impact Statement when it is available.

Very truly yours,

Allen F. Davis
for Terence P. Curran, Director
Office of Environmental Analysis

cc: Mr. George Elliott
N.Y.S. Dept. of Environmental Conservation
Route #10
Stamford, N. Y. 12167

cc: Mr. Allan A. Coburn
N.Y.S. Dept. of Environmental Conservation
P. O. Box 1169
Fisher Avenue
Cortland, N. Y. 13046



STATE OF NEW YORK
DEPARTMENT OF AGRICULTURE AND MARKETS
J. ROGER BARBER, COMMISSIONER
ALBANY, NEW YORK 12235

July 11, 1977

Mr. James F. Kelley
Deposit Watershed Work Plan
USDA Soil Conservation Service
U.S. Court House & Federal Building
Room 771
100 So. Clinton Street
Syracuse, New York 13202

Dear Mr. Kelley:

Soil Conservation Service's Draft Watershed Plan and EIS on the Deposit Watershed has been reviewed and the proposal should be most beneficial.

The area has a history of recurrent flooding and has incurred substantial economic and environmental losses due to periodic flooding. Therefore, the loss of one acre of cropland and four acres of pasture is certainly minimal to the overall savings in stabilizing the 48,437 acre watershed.

The two channelized areas should not have an adverse impact on viable agricultural land. The Bone Creek Channel is in the Village of Deposit and represents only rehabilitation work. The Elm Street diversion, in which 700 feet of new channel work is being constructed appears to be urban in nature.

The impact on viable agricultural farmland is expected to be minimal and the proposal seems to represent the best available technology for abating the flooding of the Deposit Watershed. No further comment is necessary at this time.

Sincerely,

A handwritten signature in cursive ink that reads "Louise A. Inglis".

Louise A. Inglis
Agricultural Development Assistant



BROOME COUNTY
HISTORICAL SOCIETY

May 11, 1977

Richard G. Perritt
District Conservationist
Binghamton Field Office
United States Department
of Agriculture
840 Front Street
Binghamton, New York 13905

Dear Mr. Perritt:

Thank you for the opportunity to comment on the Draft Watershed Plan and Environmental Impact Statement for the Deposit Water-shed.

The Broome County Historical Society is concerned that the proposed plans will cause an adverse impact on the cultural resources of the area.

The approximately 30 acres to be committed to the installation of structural measures in addition to the borrow areas needed to obtain fill to construct the floodwater retarding structures indicates a considerable amount of planned earthmoving. Earth moving frequently produces an adverse impact on cultural resources.

Based on culture resource surveys and inventories in other parts of Broome, Chenango and Delaware Counties it is likely that there are prehistoric and historic sites that may be impacted by the proposed construction.

Has a thorough literature search for reported cultural resources been undertaken? Have the land areas to be disturbed been systematically subsurfaced tested by qualified archaeologists?

Map I-1 (Map of Historic Places) was not included in the copy of the report that I received. Therefore I can not comment on the adequacy of the report. I know that historical documents report that the Village of Deposit was built on an 18th century

Indian village called Cookose or Cookhouse. Little is known of the Indians who lived there but remains of their occupation must still exist in the village.

The negative information concerning cultural resources reported on page E-31 is not sufficient to conclude that there are no cultural resources in the project areas. Sites related to the first approximately 10,000 years of human occupation are buried beneath the ground surface. Only systematic survey with subsurface testing. (e.g.) shovel test pitting) can locate these resources. The project areas have never been tested to my knowledge.

Page P-5 states that "Construction will not begin or continue until appropriate arrangements for survey or salvage have been made. Can you tell me how these arrangements are to be made? A pre-construction survey is essential. An adequate survey in the early planning stage of a project should identify those significant cultural resources that would be impacted. Salvage of identified resources is a last resort, only to be undertaken when a project can not be redesigned to avoid adverse impact.

Ideally, no unknown cultural resources should appear after the start of construction. Salvage at this point is expensive both monetarily to the project and historically for the loss of information that a hurried salvage excavation may incur.

Without detailed project plans I can not estimate the cost of an adequate cultural resource survey but it would be far less than 1% of the total project cost - a small price to pay for our unrenewable cultural (prehistoric and historic) resources.

If I may be of further assistance, please contact me.

Cordially,

Dolores Elliott

DOLORES ELLIOTT

P. S. You may also use this as a reply from the Triple Cities Chapter of NYSAA* known on your mailing list as the Southern Tier Archaeological Association.

DE/ms

*New York State Archeological Association



BROOME COUNTY ENVIRONMENTAL MANAGEMENT COUNCIL

DEPARTMENT OF PLANNING
COUNTY OFFICE BUILDING
GOVERNMENT PLAZA
POST OFFICE BOX 1766
BINGHAMTON, NEW YORK 13902
(607) 772-2114

XXXXXX XXXX X X X X X X X X
COUNTY EXECUTIVE
Harriet Marsi
XXXXXX XXXX X X X X X X X X
CHAIRMAN

May 6, 1977

Richard Perritt
District Conservationist
Soil Conservation Service
840 Front Street
Binghamton, NY 13905

Dear Mr. Perritt:

Over the past two years, the Broome County Environmental Management Council and staff have been working closely with U.S.D.A. Soil Conservation Service and concerned citizens in developing a plan for flood protection in the Deposit, New York, area. The Council has reviewed the Draft Water-shed Plan and Environmental Impact Statement for the Deposit Watershed and accepts this document.

The Council finds no significant adverse environmental impacts--indeed, this project as presented should improve the natural and social environment of the Village and its environs. Thus, the Council accepts this draft plan and environmental impact statement.

I hope this information is of assistance to you.

Sincerely yours,

Harriet Marsi

Harriet Marsi
Chairman

HM/jh

SUMMARY OF RECOMMENDATIONS:

ENVIRONMENTAL IMPACT STATEMENT
DEPOSIT WATERSHED
by
Environmental Review Committee

Several committee members have reviewed the environmental impact statement in detail and others have read the summary of positive and negative impacts. Our recommendations follow:

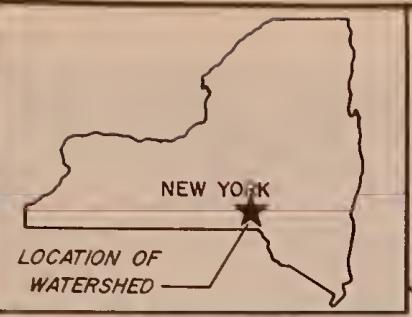
- (1) We see no great potential for adverse impact. Certainly any undertaking on the land will result in change but we recognize that change is not always bad. In this case we feel that change will be to the benefit of the environment if the plans outlined in the proposal are followed
- (2) We wish to express our gratitude that our recommendations have been incorporated in the plan.
- (3) Finally we urge immediate implementation of the Watershed Plan.

Respectfully,


James N. Briggs,
Chairman

APPENDIX D

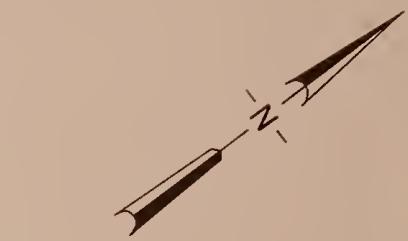
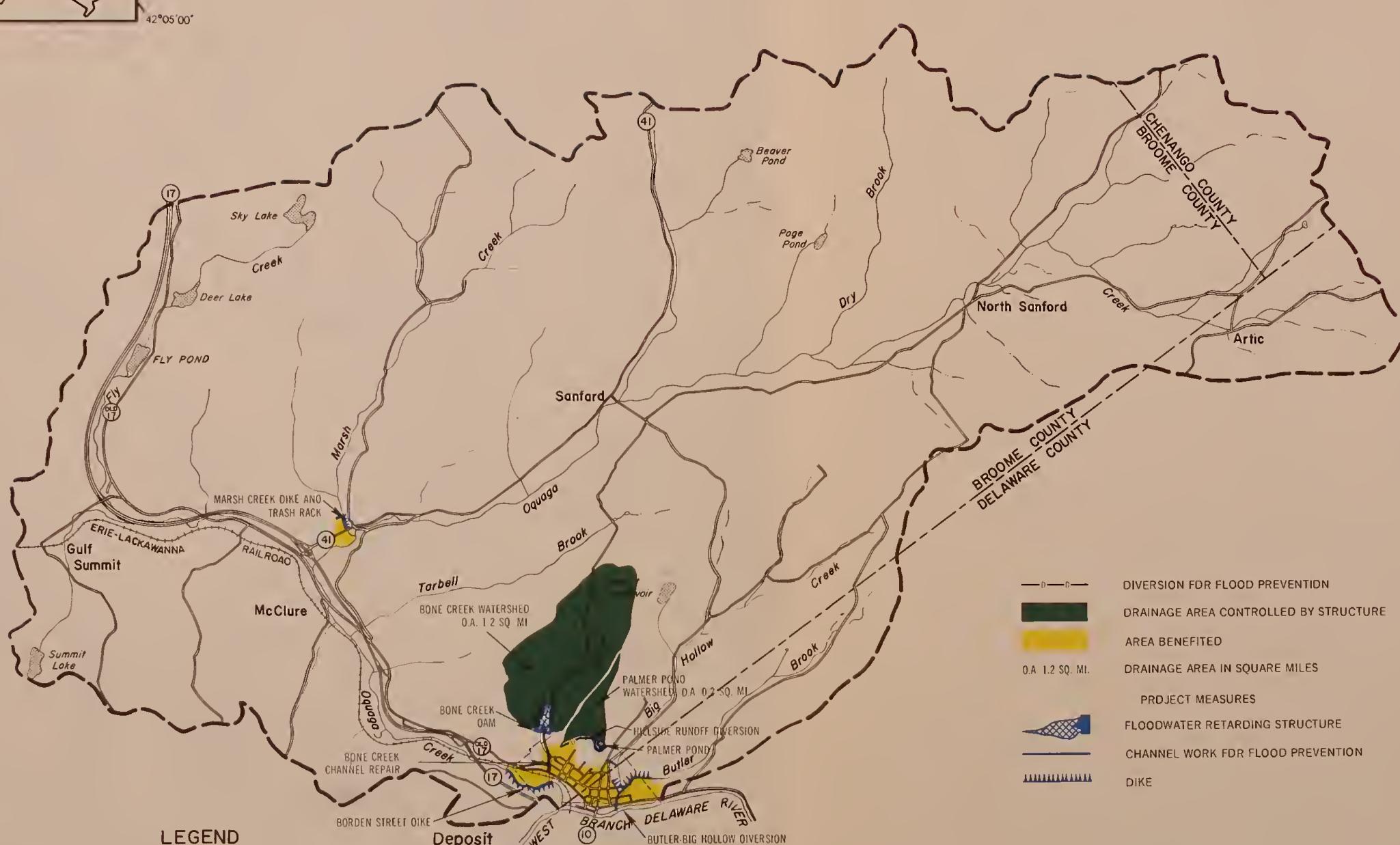




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75°32'30"

75°27'30"

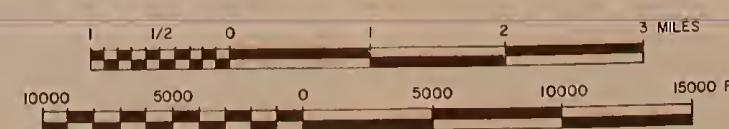


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DEPOSIT WATERSHED

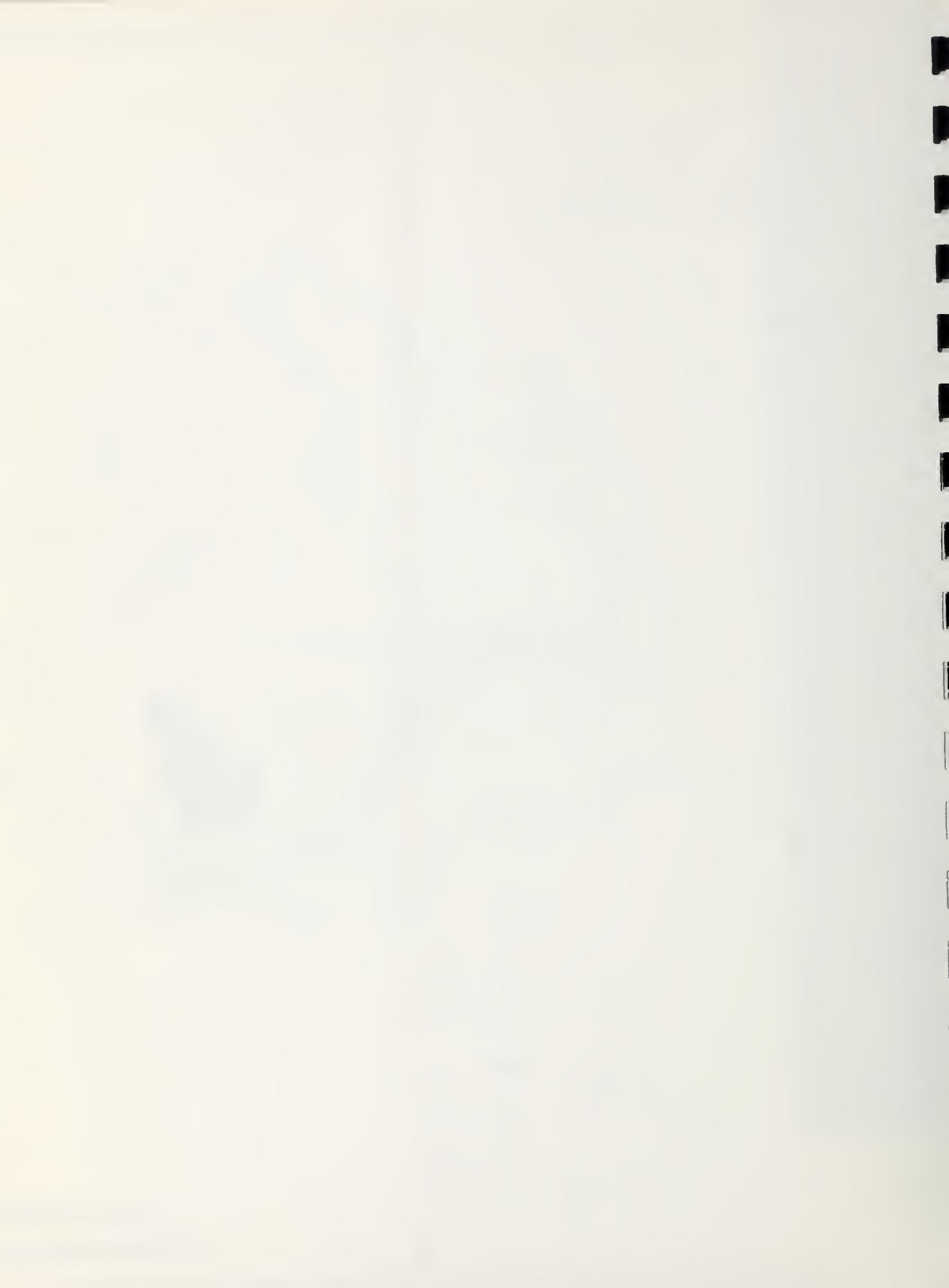
PROJECT MAP

BROOME, DELAWARE AND
CHENANGO COUNTIES, NEW YORK



OCTOBER 1976

USDA-SCS HYATTSVILLE, MD 1976

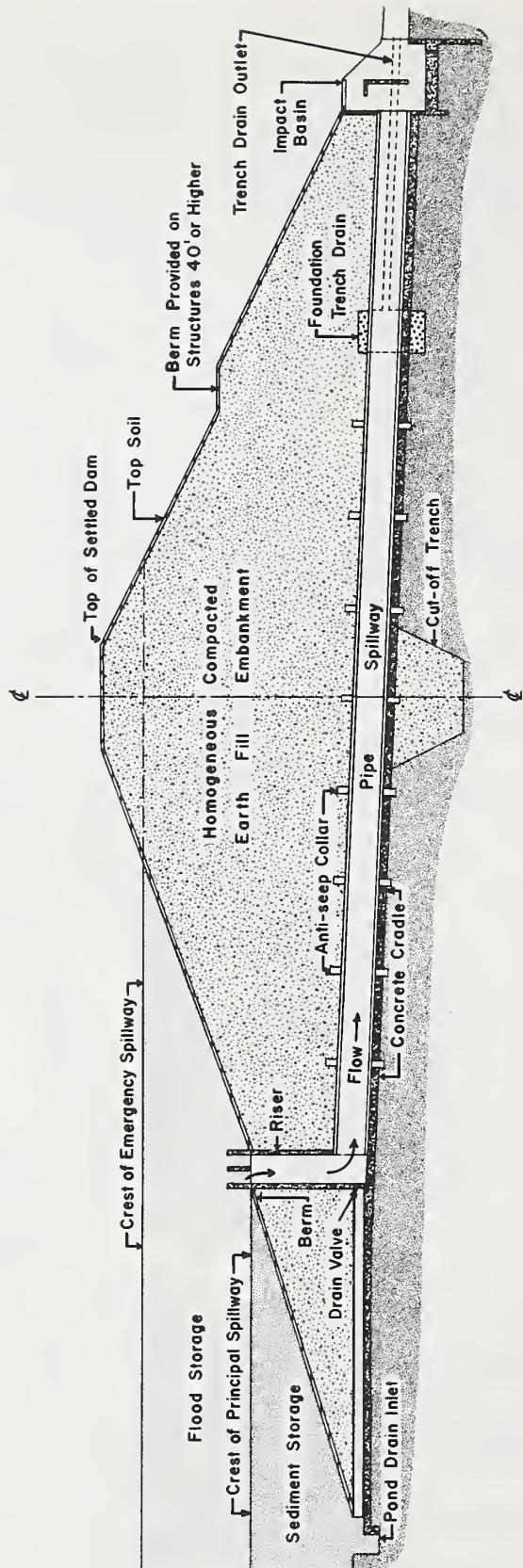


DEPOSIT WATERSHED
URBAN
FLOOD PLAIN
MAP

3000 FT.
2000
1000
0
500
1000

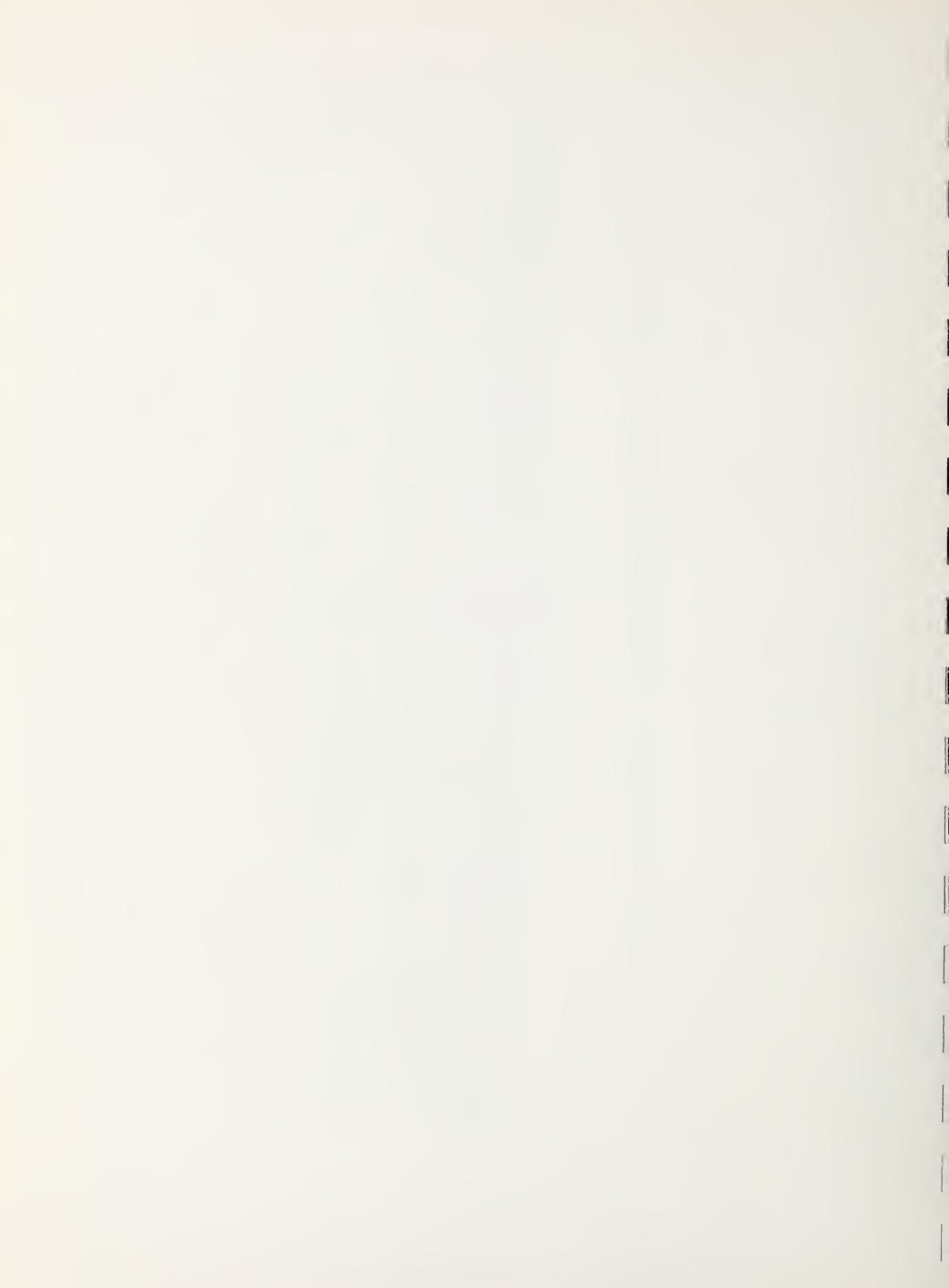
100 YEAR FLOOD LINE (PRESENT CONDITION)





TYPICAL CROSS SECTION OF FLOODWATER RETARDING STRUCTURE

APPENDIX E

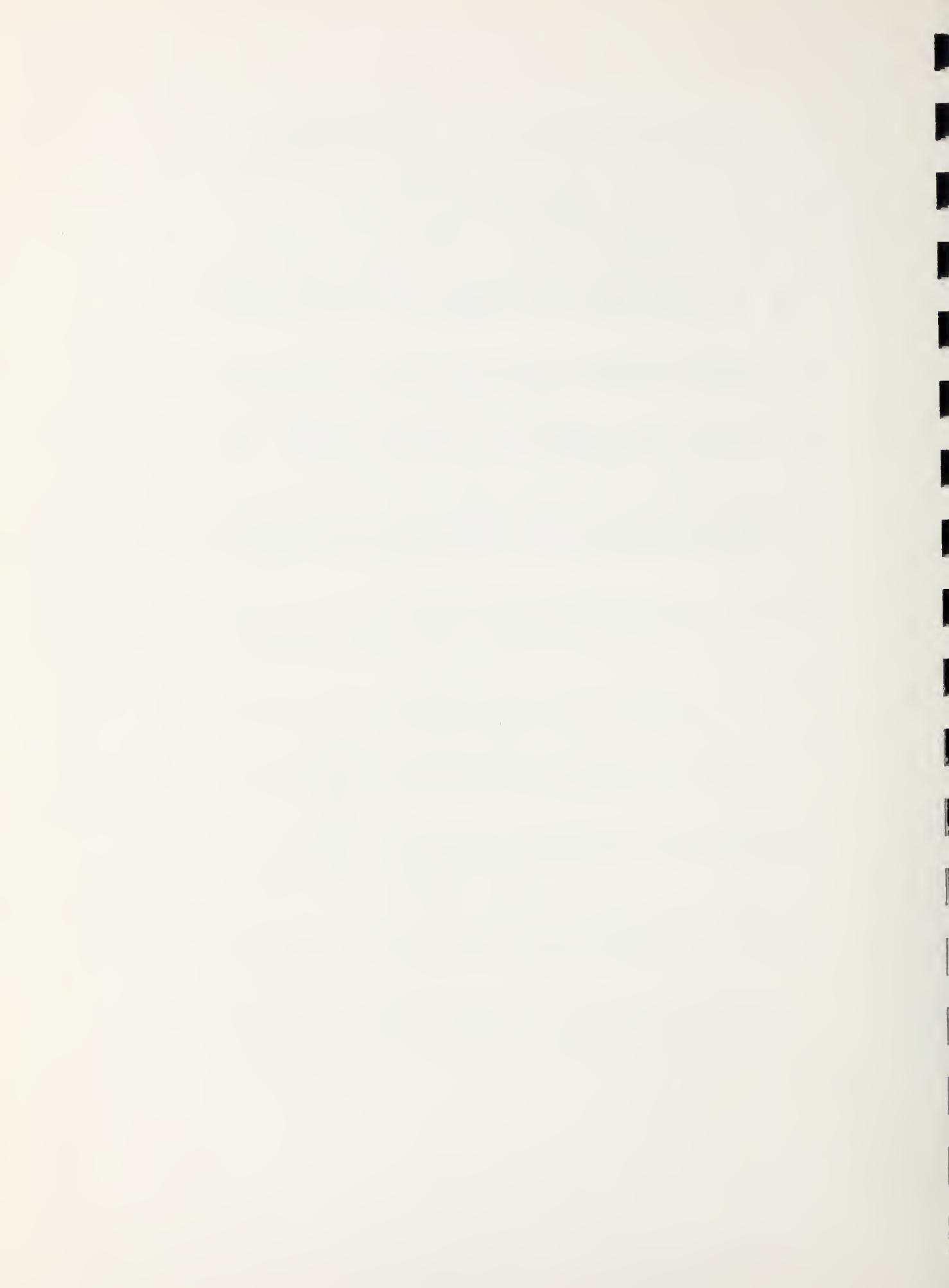


BIBLIOGRAPHY

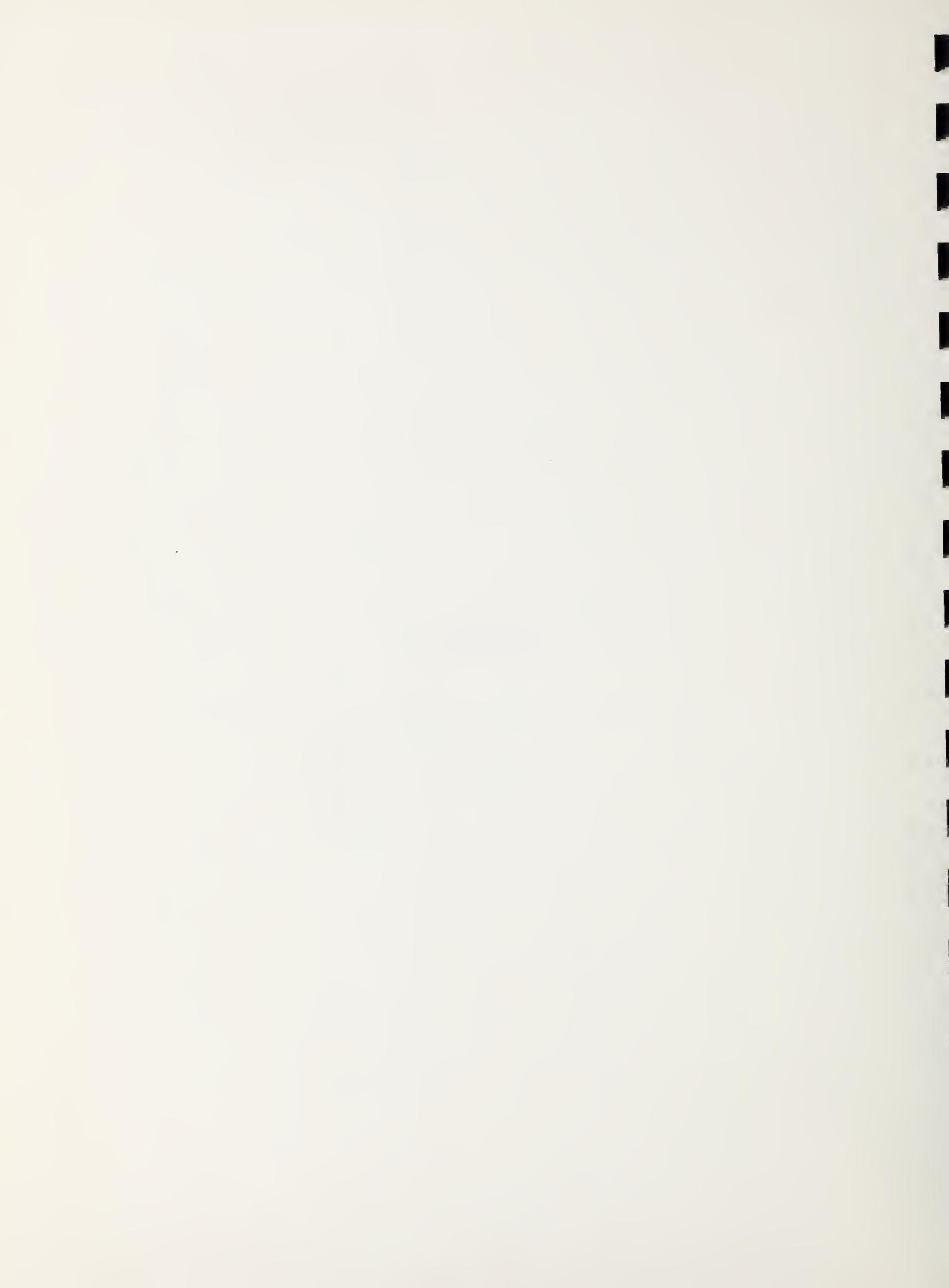
- (1) Anonymous (1970), *Land Use and Wildlife Resources*, National Academy of Sciences, Washington, D.C., 262 pgs.
- (2) Austin, Morris E., *Land Resource Regions and Major Land Resource Areas of the United States*, Agricultural Handbook 296, USDA-Soil Conservation Service, Washington, D.C. 1965.
- (3) Bureau of Outdoor Recreation, *1965 Survey of Outdoor Recreation Activities, and Outdoor Recreation Trends*, USDI, Washington, D.C.
- (4) Cline, Marlin G., *Soils and Soil Associations of New York*, New York State College of Agriculture, Cornell University, Ithaca, New York, Extension Bulletin 930.
- (5) Dethier, Bernard E., *Precipitation in New York State*, Cornell University Agricultural Experiment Station, New York, State College of Agriculture, Ithaca, New York, Bulletin 1009.
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- (7) ESSA, *Earthquake History of United States*, Part I, 1965.
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- (9) Heath, Ralph C., *Ground Water in New York*; State of New York Conservation Department, Water Resources Commission, Albany, New York; Bulletin 6W-51; 1964.
- (10) Mordoff, R.A., *The Climate of New York State*, New York State College of Agriculture at Cornell, Ithaca, New York, Extension Bulletin 764.
- (11) New York State Department of Environmental Conservation, Albany, New York, *Classification and Standards Governing the Quality and Purity of Waters of New York State*, Parts 700-703, Title 6, Official Compilation of Codes, Rules, and Regulations.

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- (13) New York State Department of Labor, Division of Reach and Statistics, *Manpower Review*, November 1976.
- (14) *New York State Environment*, New York State Department of Environmental Conservation, Albany, New York.
- (15) New York State Parks and Recreation Commission; *People-Resources-Recreation, New York Statewide Comprehensive Recreation Plan*; September 1972.
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- (22) U.S. Bureau of the Census, *Census of Population: 1970 General Social and Economic Characteristics*, Final Report PC(1)-C34 New York, GOP, Washington, D.C. 1972.
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- (24) United States Department of the Interior, *Rare and Endangered Fish & Wildlife of the United States*, U.S. Bureau of Sport Fisheries and Wildlife, 1968.
- (25) Odum, Eugene P., *"Fundamentals of Ecology"* 1971, W.B. Saunders Company, Philadelphia, Pa., p. 79.
- (26) "The Ground Water Resources of Delaware County, New York," State of New York, Department of Conservation, Water Resources Commission, Albany, New York; Bulletin 6W-50, 1963.
- (27) Dethier, B.E. and A. Boyd Pack, *Climatological Summary, Urban Climate Series No. 3*, Geneva, N.Y. September 1965.
- (28) United States Department of Agriculture, *Erosion and Sediment Inventory*, Soil Conservation Service , Syracuse, New York, 1974.
- (29) United States Department of Agriculture, *Soil Survey, Broome County, New York*, Soil Conservation Service, 1971.



APPENDIX F



DEFINITION OF LAND TREATMENT MEASURES

Conservation Plan: A document containing material for conservation of the soil and water resources of a unit of land or groups of units of land. The purpose of the plan is to provide a vehicle designed to systematically apply necessary conservation measures determined by the needs of the land and the desires of the landowner. The final results of conservation Planning should be land adequately treated.

Conservation Cropping System (acres): Growing crops in combination with needed cultural and management measures. Cropping systems include rotations that contain grasses and legumes as well as rotations in which the desired benefits are achieved without the use of such crops.

Crop Residue Use (acres): Using plant residues to protect cultivated fields during critical erosion periods.

Field Windbreak (feet): A strip or belt of trees or shrubs established within or adjacent to a field.

Irrigation System, Sprinkler (number): A planned irrigation system where all necessary facilities have been installed for the efficient application of water for irrigation by means of perforated pipes or nozzles operated under pressure.

Irrigation System-Subsurface: A planned irrigation system where all necessary water control structures have been installed for the efficient distribution of irrigation water by surface means such as furrows, borders, contour levees or contour ditches, or by subsurface means.

Pumping Plant For Water Control (number): A pumping facility installed to transfer water for a conservation need, including removing excess surface or ground water; filling ponds, ditches, or wetlands; or for pumping from wells, ponds, streams, and other sources.

Subsurface Drain (feet): A conduit, such as tile, pipe, or tubing, installed beneath the ground surface and which collects and/or conveys drainage water.

Contour Farming: Farming sloping cultivated land in such a way that plowing, preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces, diversions, or contour strips.)

Drainage Main or Lateral (feet): An open drainage ditch constructed to a designed size and grade. Does not include Drainage Field Ditch.

Agricultural Waste Management System (number): A planned agricultural waste management system to contain and manage liquid and solid wastes including runoff from concentrated waste areas with ultimate disposal in a manner which does not degrade air, soil or water resources. This practice includes systems for safe disposal of livestock wastes, municipal waste treatment plant effluents and sludges, and agricultural processing wastes through use of soil and plants.

Disposal Lagoon (number): An impoundment made by constructing an excavated pit, dam, embankment, dike, levee, or combination of these, for biological treatment of organic wastes. (Does not include holding ponds and tanks.)

Minimum Tillage (acres): Limiting the number of cultural operations to those that are properly timed and essential to produce a crop and prevent soil damage.

Diversion (feet): A channel with a supporting ridge on the lower side constructed across the slope.

Mulching (acres): Applying plant residues or other suitable materials not produced on the site to the soil surface.

Grassed Waterway or Outlet (acres): A natural or constructed waterway or outlet shaped or graded and established in vegetation suitable to safely dispose of runoff from a field, diversion, terrace, or other structure.

Stripcropping, Field: Growing crops in a systematic arrangement of strips or bands across the general slope (not on the contour) to reduce water erosion. The crops are arranged so that a strip of grass or close-growing crop is alternated with a clean-tilled crop or fallow.

Pasture and Hayland Management (acres): Proper treatment and use of pastureland or hayland.

Pasture and Hayland Planting (acres): Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants. (Includes Pasture and Hayland Renovation. Does not include Grassed Waterway or Outlet on cropland.)

Pond (number): A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".

Fishpond Management (number): Developing or improving impounded water to produce fish for domestic use or recreation.

Deferred Grazing (acres): Postponing grazing or resting grazing land for a prescribed period.

Proper Grazing Use (acres): Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.

Field Border (feet): A border or strip of perennial vegetation established at the edge of a field by planting or by converting it from trees to herbaceous vegetation or shrubs.

Tree Planting (acres): The artificial establishment of forest cover necessary to adjust and improve land use, to upgrade its productive capability, reduce runoff and erosion, and bring new areas into production.

Recreation Area Improvement (acres): Establishing grasses, legumes, vines, shrubs, trees, or other plants or selectively reducing stand density and trimming woody plants to improve an area for recreation.

Recreation Land Grading and Shaping (acres): Altering the surface of land to meet the requirement of recreation facilities.

Recreation Trail and Walkway (feet): A pathway prepared especially for pedestrian, equestrian, and cycle travel.

Access Road (feet): A road constructed as a part of a conservation plan to provide needed access.

Wildlife Watering Facility (number): Constructing, improving, or modifying watering facilities for wildlife.

Wildlife Upland Habitat Management (acres): Retaining, creating or managing wildlife habitat other than wetland.

Wildlife Wetland Habitat Management (acres): Retaining, creating, or managing wetland habitat for wildlife.

Critical Area Planting (acres): Planting vegetation such as trees, shrubs, vines, grasses, or legumes on critical areas. (Does not include tree planting mainly for wood products.)

Mulching (acres): Applying plant residues or other suitable materials not produced on the site to the soil surface.

Harvest Cutting (acres): The making and cutting of mature and overmature forest stands for harvest of forest products.

Woodland Grazing Control (Fencing) (miles and acres): The fencing out of domestic livestock to prevent the impairment of tree growth and development and forest hydrologic conditions.

Log Road and Skid Trail Erosion Control (miles and acres): Revegetation of eroding areas on old logging roads and skid trails and installation of water bars and other small water diverting structures to channel runoff from the road surface to undisturbed forest land.

Forest Management Plans for Multiple Use Management: A plan that identifies problem areas and outlines basic treatment measures for the maintenance, utilization, and improvement of the forest resources while protecting watershed conditions. The plan may be simple, requiring only a brief reconnaissance from which general recommendations for protective practices during forest land uses can be projected. Or on the other hand, it may be quite specific, prepared after an extensive field examination where objectives such as cultural operations, harvest rotation, type of cut, erosion control measures, wildlife habitat, recreation improvement, urban forestry, environmental beautification and other practices are recommended.

Forest Environmental Improvement: Vegetative manipulation of stand stocking in immature stand to reduce overcrowding, increase growth and vigor, eliminate diseased or deformed species, improve wildlife habitat and recreation opportunities, while protecting and improving hydrologic conditions and aesthetic quality.

WETLAND DEFINITIONS

The following is a definition of wetland types as per "Wetlands of the United States," Circular 39, USDI, Fish and Wildlife Service, Washington, D.C., 1971.

Type 1, "Seasonally Flooded Basins or Flats" - The soil is covered with water, or is waterlogged, during variable seasonal periods, but usually well drained during much of the growing season. This type occurs both in upland depressions and in overflow bottomlands. Vegetation varies greatly and may include bottomland hardwoods and herbaceous growths such as smartweeds, wild millet, fall panicum, tealgrass, marsh elder and ragweed. Waterfowl use this type for migration, nesting and wintering.

Type 2, "Inland Fresh Meadows" - The soil is usually without standing water during most of the growing season, but is waterlogged within at least a few inches of its surface. Vegetation includes grasses, sedges, rushes, and various broad-leaved plants. Fresh meadows are used by nesting waterfowl, but their value is mainly as supplemental feeding areas.

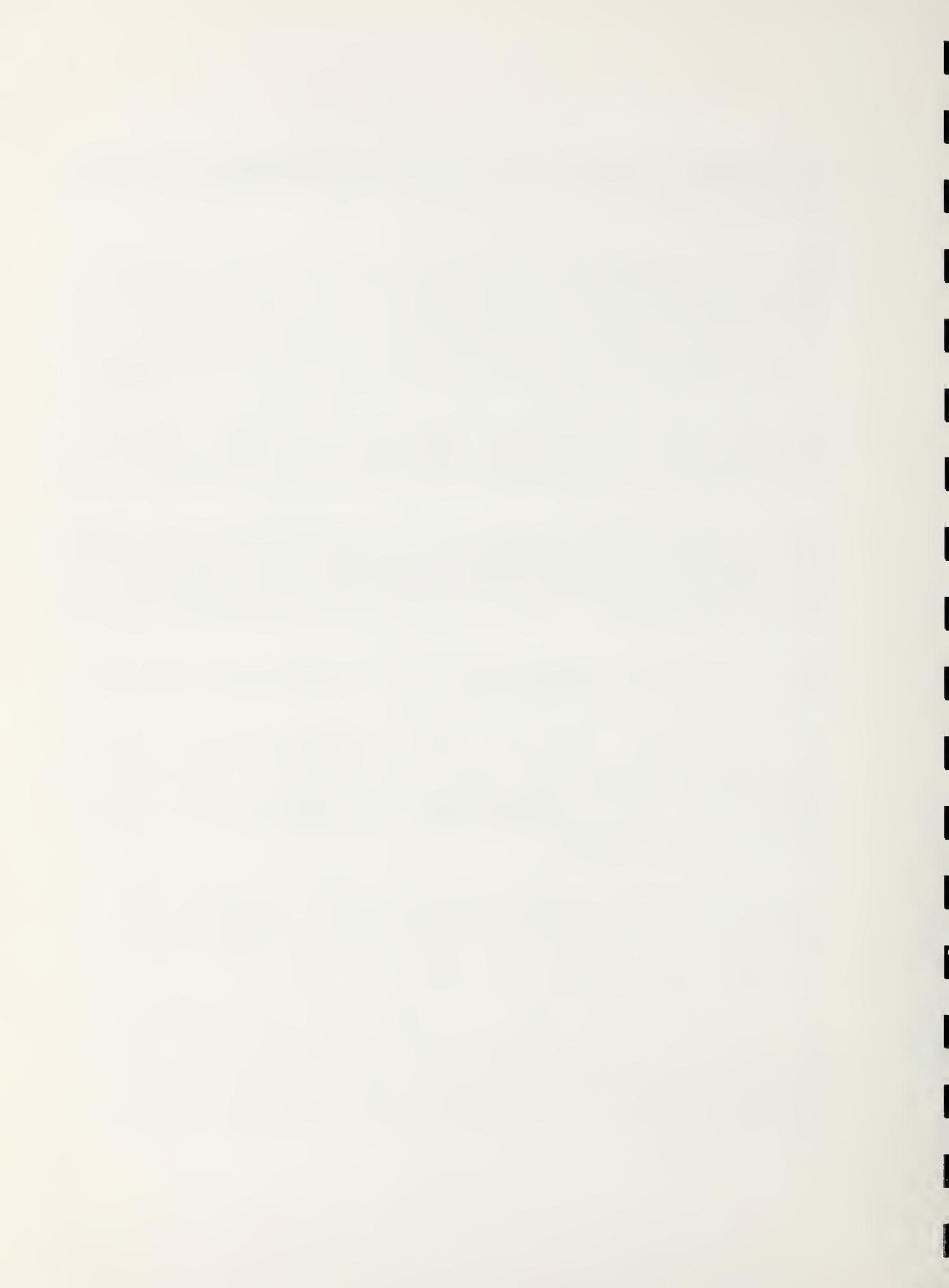
Type 3, "Inland Shallow Fresh Marshes" - The soil is usually waterlogged during the growing season. Often it is covered with up to 6 inches or more of water. The vegetation contains such species as cattails, bulrushes, and arrowheads. Waterfowl and marsh birds use the area for feeding and nesting.

Type 4, "Inland Deep Fresh Marshes" - Water is usually less than 10 feet deep. Vegetation is pondweeds, water lilies, coontail, and other submerged aquatics, highly used by waterfowl.

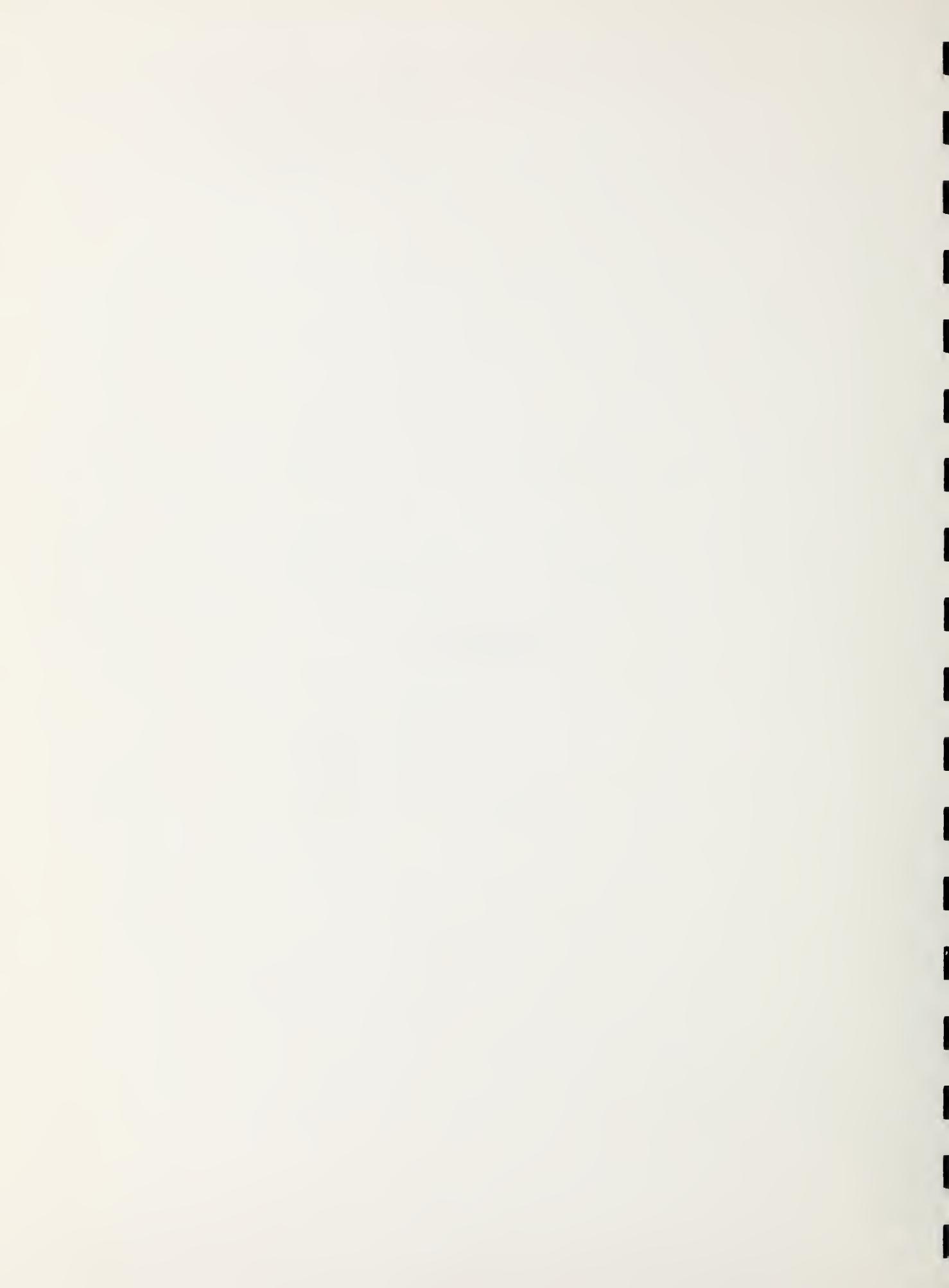
Type 5, "Inland Open Fresh Water" - Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, wild celery, coontail, water milfoils, musk grasses, water lilies, and spatterdocks. Where vegetation is plentiful, they are used as nesting and feeding areas by ducks, geese, and coots, especially during migration.

Type 6, "Shrub Swamps" - The soil is usually waterlogged during the growing season and is often covered with as much as 6 inches of water. They contain vegetation such as alders, buttonbrush, dogwoods, etc. They provide some food value for wood duck, woodcock, black duck, deer, and rabbit. Songbirds also use the area for nesting.

Type 7, "Wooded Swamps" - The soil is waterlogged at least to within a few inches of its surface during the growing season and is often covered with as much as 1 foot of water. They contain tree species of willow, red maple, elm (large portion dead due to dutch elm disease) and some white cedar and when bordering water, nesting is provided for wood and black ducks. Habitat is also provided for deer and songbirds with an occasional grouse.



APPENDIX G



WATERSHED AMPHIBIANS^{1/}

Red Eft Newt (*Diemictylus viridescens*)
 Dusky Salamander (*Desmognathus fuscus*)
 Mountain Salamander (*Desmognathus ochrophaeus*)
 Red-backed Salamander (*Plethodon cinereus*)
 Slimy Salamander (*Plethodon glutinosus*)
 Four-toed Salamander (*Hemidactylum scutatum*)
 Spring Salamander (*Gyrinophilus porphyriticus*)
 Two-lined Salamander (*Eurycea bislineata*)
 Spotted Salamander (*Ambystoma maculatum*)
 Pickerel Frog (*Rana palustris*)

Eastern Spadefoot Toad (*Scaphiopus holbrookii*)
 American Toad (*Bufo americanus*)
 Fowler's Toad (*Bufo woodhousei*)
 Spring Peeper (*Hyla crucifer*)
 Gray Treefrog (*Hyla versicolor*)
 Mink Frog (*Rana septentrionalis*)
 Bullfrog (*Rana catesbeiana*)
 Green Frog (*Rana clamitans*)
 Leopard Frog (*Rana pipiens*)
 Wood Frog (*Rana sylvatica*)

WATERSHED REPTILES^{2/}

Snapping Turtle (*Chelydra serpentina*)
 Stinkpot (*Sternotherus odoratus*)
 Spotted Turtle (*Clemmys guttata*)
 Eastern Box Turtle (*Terrapene carolina*)
 Map Turtle (*Graptemys geographicus*)
 Painted Turtle (*Chrysemys picta*)
 Blanding's Turtle (*Emydoidea blandingii*)
 Northern Water Snake (*Natrix sipedon*)
 Red-bellied Snake (*Storeria occipitomaculata*)
 Eastern Garter Snake (*Thamnophis sirtalis*)
 Ribbon Snake (*Thamnophis sauritus*)

Eastern Hognose Snake (*Heterodon platyrhinos*)
 Ringneck Snake (*Diadophis punctatus*)
 De Kay's Snake (*Storeria dekayi*)
 Worm Snake (*Carpophis amoenus*)
 Black Racer (*Coluber constrictor*)
 Smooth Green Snake (*Opheodrys vernalis*)
 Black Rat Snake (*Elaphe obsoleta*)
 Milk Snake (*Lampropeltis triangulum*)
 Copperhead (*Agkistrodon contortrix*)
 Timber Rattlesnake (*Crotalus horridus*)

WATERSHED MAMMALS^{3/}

Opossum (*Didelphis marsupialis*)
 Masked Shrew (*Sorex cinereus*)
 Smoky Shrew (*Sorex fumeus*)
 Pigmy Shrew (*Microsorex hoyi*)
 Short-tailed Shrew (*Blarina brevicauda*)
 Least Shrew (*Cryptotis parva*)
 Hairy-tailed Mole (*Parascalops breweri*)
 Common Mole (*Scalopus aquaticus*)
 Star-Nosed Mole (*Condylura cristata*)
 Little Brown Bat (*Myotis lucifugus*)
 Eastern Long-eared Bat (*Myotis keenii*)
 Small-footed Bat (*Myotis subulatus*)
 Silver-haired Bat (*Lasionycteris noctivagans*)
 Pipistrelle (*Pipistrellus subflavus*)
 Big Brown Bat (*Eptesicus fuscus*)
 Red Bat (*Lasiurus borealis*)
 Hoary Bat (*Lasiurus cinereus*)
 Eastern Big-eared Bat (*Corynorhinus macrotis*)
 Varying Hare (*Lepus americanus*)
 Cottontail Rabbit (*Sylvilagus spp.*)
 Woodchuck (*Marmota monax*)
 Chipmunk (*Tamias striatus*)
 Gray Squirrel (*Sciurus carolinensis*)

Red Squirrel (*Tamiasciurus hudsonicus*)
 Flying Squirrel (*Glaucomys volans*)
 Beaver (*Castor canadensis*)
 Deer Mouse (*Peromyscus maniculatus*)
 White-footed Mouse (*Peromyscus leucopus*)
 Eastern Woodrat (*Neotoma magister*)
 Lemming Mouse (*Synaptomys cooperi*)
 Red-backed Vole (*Clethrionomys gapperi*)
 Meadow Mouse (*Microtus pennsylvanicus*)
 Pine Mouse (*Pitymys pinetorum*)
 Muskrat (*Ondatra zibethicus*)
 Norway Rat (*Rattus norvegicus*)
 House Mouse (*Mus musculus*)
 Jumping Mouse (*Zapus hudsonius*)
 Woodland Jumping Mouse (*Napaeozapus insignis*)
 Red Fox (*Vulpes fulva*)
 Grey Fox (*Urocyon cinereoargenteus*)
 Raccoon; Coon (*Procyon lotor*)
 Least Weasel (*Mustela rixosa*)
 Long-tailed Weasel (*Mustela frenata*)
 Mink (*Mustela vison*)
 Striped Skunk (*Mephitis mephitis*)
 White-tailed Deer (*Odocoileus virginianus*)

^{1/} Wright, A. H., Frogs and Toads of New York, NYS Conservation Department, Division of Conservation Education Information Leaflet H-6 AS 55.

Reilly, E. M., Salamanders and Lizards of New York, NYS Conservation Department, Division of Conservation Education Information Leaflet H-2 JJ 57.

^{2/} Reilly, E. M., Turtles of New York, Division of Conservation Education Information Leaflet H3 JJ 58.
 Reilly, E. M., Turtles of New York, NYS Conservation Department, Division of Conservation Education Information Leaflet H3 JJ 58.

^{3/} Anonymous Mammals of New York, NYS Conservation Department, Division of Conservation Education Information Leaflet B13.

WATERSHED BIRDS^{1/}

Common Loon (*Gavia immer*)
 Pied-billed Grebe (*Podilymbus podiceps* *podiceps*)
 Great Blue Heron (*Ardea herodias* *herodias*)
 Little Blue Heron (*Florida caerulea* *caerulea*)
 Black-crowned Night Heron (*Nycticorax nycticorax* *hoactli*)
 American Bittern (*Botaurus longiginosus*)
 Brant (*Branta bernicla* *hrota*)
 Blue Goose (*Chen caerulescens*)
 Black Duck (*Anas rubripes*)
 Pintail (*Anas acuta*)
 Blue-winged Teal (*Anas discors* *discors*)
 American Widgeon (*Mareca americana*)
 Wood Duck (*Aix sponsa*)
 Ring-necked Duck (*Aythya collaris*)
 Greater Scaup (*Aythya marila* *nearctica*)
 Oldsquaw (*Clangula hyemalis*)
 King Eider (*Somateria spectabilis*)
 Ruddy Duck (*Oxyura jamaicensis* *rubida*)
 Common Merganser (*Mergus merganser americanus*)
 Sharp-shinned Hawk (*Accipiter striatus* *velox*)
 Red-tailed Hawk (*Buteo jamaicensis* *borealis*)
 Broad-winged Hawk (*Buteo platypterus* *platypterus*)
 Marsh Hawk (*Circus cyaneus* *hudsonius*)
 Sparrow Hawk (*Falco sparverius* *sparverius*)
 Turkey (*Meleagris gallopavo* *silvestris*)
 Sora Rail (*Porzana carolina*)
 American Coot (*Fulica americana* *americana*)
 Kildeer (*Charadrius vociferus* *vociferus*)
 Ruddy Turnstone (*Arenaria interpres* *morinella*)
 Common Snipe (*Capella gallinago* *delicata*)
 Spotted Sandpiper (*Actitis macularia*)
 Greater Yellowlegs (*Totanus melanoleucus*)
 Knot (*Calidris canutus* *rufa*)
 Dunlin (*Erolia alpina* *pacifica*)
 Stilt Sandpiper (*Micropalama himantopus*)
 Western Sandpiper (*Ereunetes mauri*)
 Hudsonian Godwit (*Limosa haemastica*)
 Red Phalarope (*Phalaropus fulicarius*)
 Northern Phalarope (*Lobipes lobatus*)
 Iceland Gull (*Larus glaucopterus* *glaucopterus*)
 Bonaparte's Gull (*Larus philadelphia*)
 Rock Dove (*Columba livia*)
 Yellow-billed Cuckoo (*Coccyzus americanus* *americanus*)
 Barred Owl (*Tyto alba* *pratincola*)
 Great Horned Owl (*Bubo virginianus* *virginianus*)
 Short-eared Owl (*Asio flammeus* *flammeus*)
 Common Nighthawk (*Chordeiles Minor*)
 Ruby-throated Hummingbird (*Archilochus colubris*)
 Yellow-shafted Flicker (*Colaptes auratus* *luteus*)
 Red-bellied Woodpecker (*Centurus carolinus* *zebra*)

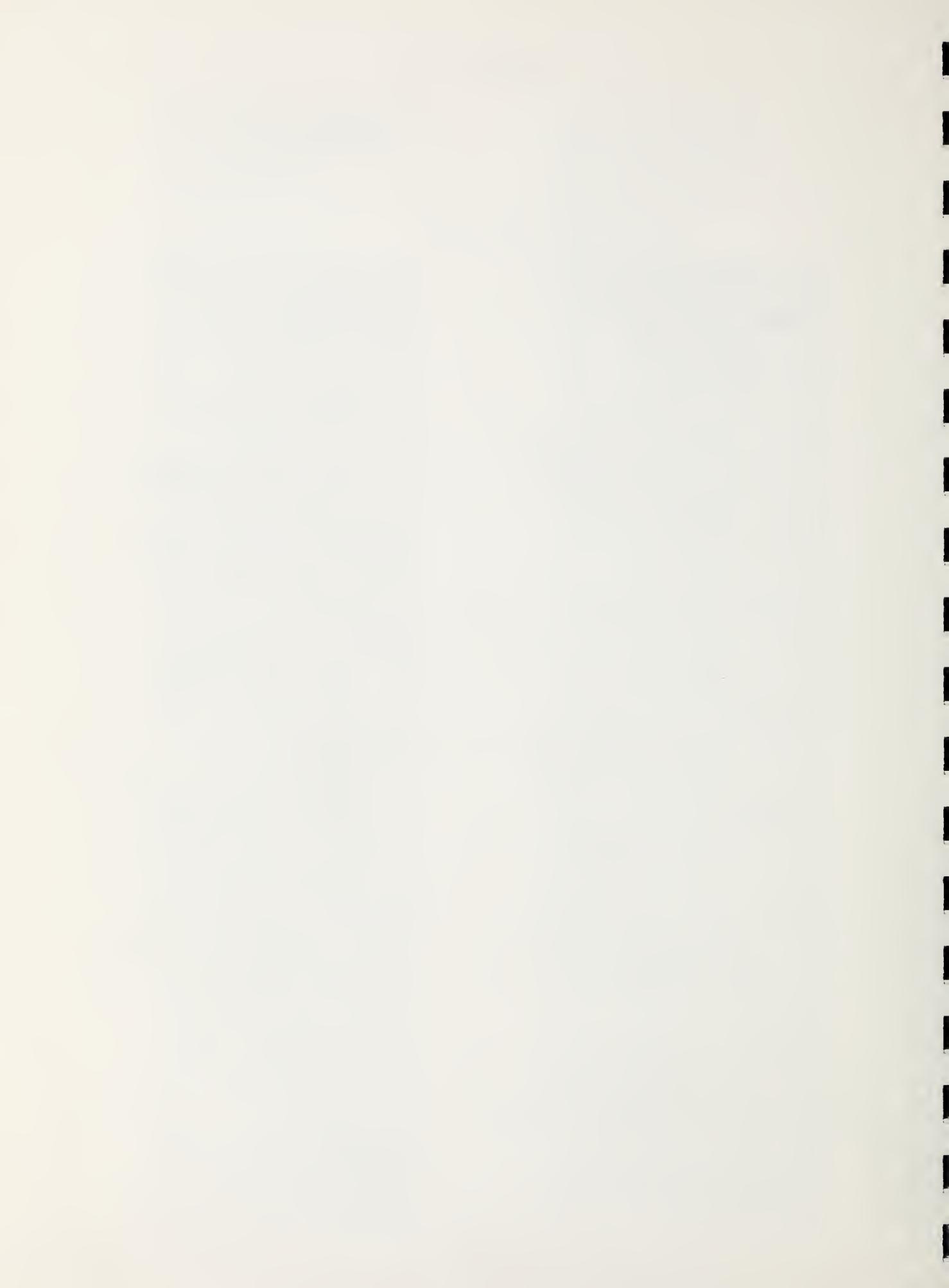
 Yellow-bellied Sapsucker (*Sphyrapicus varius* *varius*)
 Downy Woodpecker (*Dendrocopos pubescens* *medianus*)
 Great Crested Flycatcher (*Myiarchus crinitus* *boreus*)
 Trail's Flycatcher (*Epidonomus traiillii*)
 Eastern Wood Pewee (*Contopus virens*)
 Horned Lark (*Eremophila alpestris*)
 Bank Swallow (*Riparia riparia* *riparia*)
 Purple Martin (*Progne subis* *subis*)
 Black-capped Chickadee (*Parus atricapillus*)
 Red-breasted Nuthatch (*Sitta canadensis*)
 House Wren (*Troglodytes aedon* *baldwini*)
 Long-billed Marsh Wren (*Telmatodytes palustris* *dissaeptus*)
 Barn Swallow (*Hirundo rustica* *erythrogaster*)
 Mockingbird (*Minus polyglottos* *polyleontos*)
 Brown Thrasher (*Toxostoma rufum* *rufum*)
 Wood Thrush (*Hylocichla mustelina*)
 Gray-cheeked Thrush (*Hylocichla minima*)
 Eastern Bluebird (*Sialia sialis* *sialis*)
 Golden-crowned Kinglet (*Regulus satrapa* *satrapa*)
 Water Pipit (*Anthus spinolletta* *rubescens*)
 Northern Shrike (*Lanius excubitor* *borealis*)
 Starling (*Sturnus vulgaris* *vulgaris*)
 Solitary Vireo (*Vireo solitarius* *solitarius*)
 Philadelphia Vireo (*Vireo philadelphicus*)
 Black-and White Warbler (*Mniotilla varia*)
 Golden-winged Warbler (*Vermivora chrysoptera*)
 Nashville Warbler (*Vermivora rufigula* *rufigula*)
 Yellow Warbler (*Dendroica petechia* *aeslia*)
 Cape May Warbler (*Dendroica tigrina*)
 Myrtle Warbler (*Dendroica coronata*)
 Cerulean Warbler (*Dendroica cerulea*)
 Chestnut-sided Warbler (*Dendroica pensylvanica*)
 Blackpoll Warbler (*Dendroica striata*)
 Ovenbird (*Seiurus aurocapillus* *aurocapillus*)
 Louisiana Waterthrush (*Seiurus motacilla*)
 Yellowthroat (*Geothlypis trichas* *brachypterus*)
 Hooded Warbler (*Wilsonia citrina*)
 Canada Warbler (*Wilsonia canadensis*)
 House Sparrow (*Passer domesticus* *domesticus*)
 Eastern Meadowlark (*Sturnella magna* *magna*)
 Redwinged Blackbird (*Agelaius phoeniceus*)
 Rusty Blackbird (*Euphagus carolinus*)
 Brown-headed Cowbird (*Molothrus ater* *ater*)
 Cardinal (*Richmondena cardinalis* *cardinalis*)
 Indigo Bunting (*Passerina cyanea*)
 Pine Grosbeak (*Pinicola enucleator* *eschatus*)
 Pine Siskin (*Spinus pinus* *pinus*)
 Red Crossbill (*Loxia curvirostra* *minor*)
 Savanna Sparrow (*Passerherbulus sandwichensis*)
 Henslow's Sparrow (*Passerherbulus henslowii* *henslowii*)
 Slate-colored Junco (*Junco hyemalis* *hyemalis*)
 Chipping Sparrow (*Spizella passerina* *passerina*)
 White-crowned Sparrow (*Zonotrichia leucophrys* *leucophrys*)
 Fox Sparrow (*Passerellus iliaca* *iliaca*)
 Swamp Sparrow (*Melospiza georgiana* *georgiana*)
 Snow Bunting (*Plectrophenax nivalis* *nivalis*)

 Horned Grebe (*Podiceps auritus* *cornutus*)
 Double-crested Cormorant (*Phalacrocorax auritus* *auritus*)
 Green Heron (*Butorides virescens* *virescens*)
 Common Egret (*Casmerodius albus* *egretta*)
 Least Bittern (*Ixobrychus exilis* *exilis*)
 Canada Goose (*Branta canadensis*)
 Snow Goose (*Chen hyperborea* *hyperborea*)
 Mallard (*Anas platyrhynchos* *platyrhynchos*)
 Gadwall (*Anas strepera*)
 Green-winged Teal (*Anas carolinensis*)
 European Widgeon (*Mareca penelope*)
 Shoveler (*Spatula clypeata*)
 Redhead (*Aythya americana*)
 Canvasback (*Aythya valisineria*)
 Lesser Scaup (*Aythya affinis*)
 Harlequin Duck (*Histrionicus histrionicus*)
 Common Scoter (*Didemna nigra* *americana*)
 Hooded Merganser (*Lophodytes cucullatus*)
 Red-breasted Merganser (*Mergus serrator* *serrator*)
 Cooper's Hawk (*Accipiter cooperii*)
 Red-shouldered Hawk (*Buteo lineatus* *lineatus*)
 Rough-legged Hawk (*Buteo lagopus* *s. johannisi*)
 Pigeon Hawk (*Falcon columbarius* *columbarius*)
 Ruffed Grouse (*Bonasa umbellus* *monticola*)
 Virginia Rail (*Rallus limicola* *limicola*)
 Common Gallinule (*Gallinula chloropus* *cachinnans*)
 Semipalmated Plover (*Charadrius semipalmatus*)
 Black-bellied Plover (*Squatarola squatarola*)
 American Woodcock (*Philohela minor*)
 Upland Plover (*Bartramia longicauda*)
 Solitary Sandpiper (*Tringa solitaria* *solitaria*)
 Lesser Yellowlegs (*Totanus flavipes*)
 Least Sandpiper (*Erolia minutilla*)
 Oowitcher (*Limnodromus griseus*)
 Semipalmated Sandpiper (*Ereunetes pusillus*)
 Buff-breasted Sandpiper (*Trynnites subruficollis*)
 Sanderling (*Crocethia alba*)
 Wilson's Phalarope (*Steganopus tricolor*)
 Herring Gull (*Larus argentatus* *smithsonianus*)
 Ring-billed Gull (*Larus delawarensis*)
 Common Tern (*Sterna hirundo* *hirundo*)
 Mourning Dove (*Zenaidura macroura* *carolinensis*)
 Black-billed Cuckoo (*Coccyzus erythrophthalmus*)
 Screech Owl (*Tus asio* *naevius*)
 Barred Owl (*Strix varia* *varia*)
 Whip-Poor-Will (*Caprimulgus vociferus* *vociferus*)
 Chimney Swift (*Chaetura pelagica*)
 Belted Kingfisher (*Megaceryle alcyon* *alcyon*)
 Pileated Woodpecker (*Oryocopus pileatus*)
 Red-headed Woodpecker (*Melanerpes erythrocephalus* *erythrocephalus*)
 Hairy Woodpecker (*Dendrocopos villosus* *villosus*)
 Eastern Kingbird (*Tyrannus tyrannus*)
 Eastern Phoebe (*Sayornis phoebe*)
 Least Flycatcher (*Empidonax minimus*)
 Olive-sided Flycatcher (*Nuttallornis borealis*)
 Tree Swallow (*Iridoprocne bicolor*)
 Rough-winged Swallow (*Stelgidopteryx ruficollis* *serripennis*)
 Cliff Swallow (*Petrochelidon pyrrhonota* *pyrrhonota*)
 Common Crow (*Corvus brachyrhynchos* *brachyrhynchos*)
 White-breasted Nuthatch (*Sitta carolinensis* *cookei*)
 Brown Creeper (*Certhia familiaris* *americanus*)
 Winter Wren (*Troglodytes troglodytes* *hiemalis*)
 Short-billed Marsh Wren (*Cistothorus platensis* *stellaris*)
 Catbird (*Dumetella carolinensis*)
 Robin (*Turdus migratorius* *migratorius*)
 Swainson's Thrush (*Hylocichla ustulata* *swainsoni*)
 Veery (*Hylocichla fuscescens*)
 Blue-gray Gnatcatcher (*Polioptila caerulea* *caerulea*)
 Ruby-crowned Kinglet (*Regulus calendula* *calendula*)
 Cedar Waxwing (*Bombycilla cedarorum*)
 Loggerhead Shrike (*Lanius ludovicianus* *migrans*)
 Yellow-throated Vireo (*Vireo flavifrons*)
 Red-eyed Vireo (*Vireo olivaceus*)
 Warbling Vireo (*Vireo gilvus* *gilvus*)
 Prothonotary Warbler (*Protonotaria citrea*)
 Orange-crowned Warbler (*Vermivora celata* *celata*)
 Parula Warbler (*Parula americana*)
 Magnolia Warbler (*Dendroica magnolia*)
 Black-throated Blue Warbler (*Dendroica caerulea* *caerulea*)
 Black-throated Green Warbler (*Dendroica virens* *virens*)
 Blackburnian Warbler (*Dendroica fusca*)
 Bay-breasted Warbler (*Dendroica castanea*)
 Palm Warbler (*Dendroica palmarum* *palmarum*)
 Northern Waterthrush (*Seiurus noveboracensis*)
 Mourning Warbler (*Opornis philadelphica*)
 Yellow-breasted Chat (*Icteria virens* *virens*)
 Wilson's Warbler (*Wilsonia pusilla* *pusilla*)
 American Redstart (*Setophaga ruticilla* *ruticilla*)
 Bobolink (*Dolichonyx oryzivorus*)
 Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)
 Baltimore Oriole (*Icterus galbula*)
 Common Grackle (*Quiscalus quiscula* *versicolor*)
 Scarlet Tanager (*Piranga olivacea*)
 Rose-breasted Grosbeak (*Pheucticus ludovicianus*)
 Purple Finch (*Carpodacus purpureus* *purpureus*)
 Common Redpoll (*Acanthis flammea*)
 American Goldfinch (*Spinus tristis* *tristis*)
 Rufous-sided Towhee (*Pipilo erythrrophthalmus* *erythrrophthalmus*)
 Grasshopper Sparrow (*Ammodramus savannarum* *pratinensis*)
 Vesper Sparrow (*Pooecetes gramineus* *gramineus*)
 Tree Sparrow (*Spizella arborea* *arborea*)
 Field Sparrow (*Spizella pusilla* *pusilla*)
 White-throated Sparrow (*Zonotrichia albicollis*)
 Lincoln's Sparrow (*Melospiza lincolni* *lincolni*)
 Song Sparrow (*Melospiza melodia* *euphonia*)

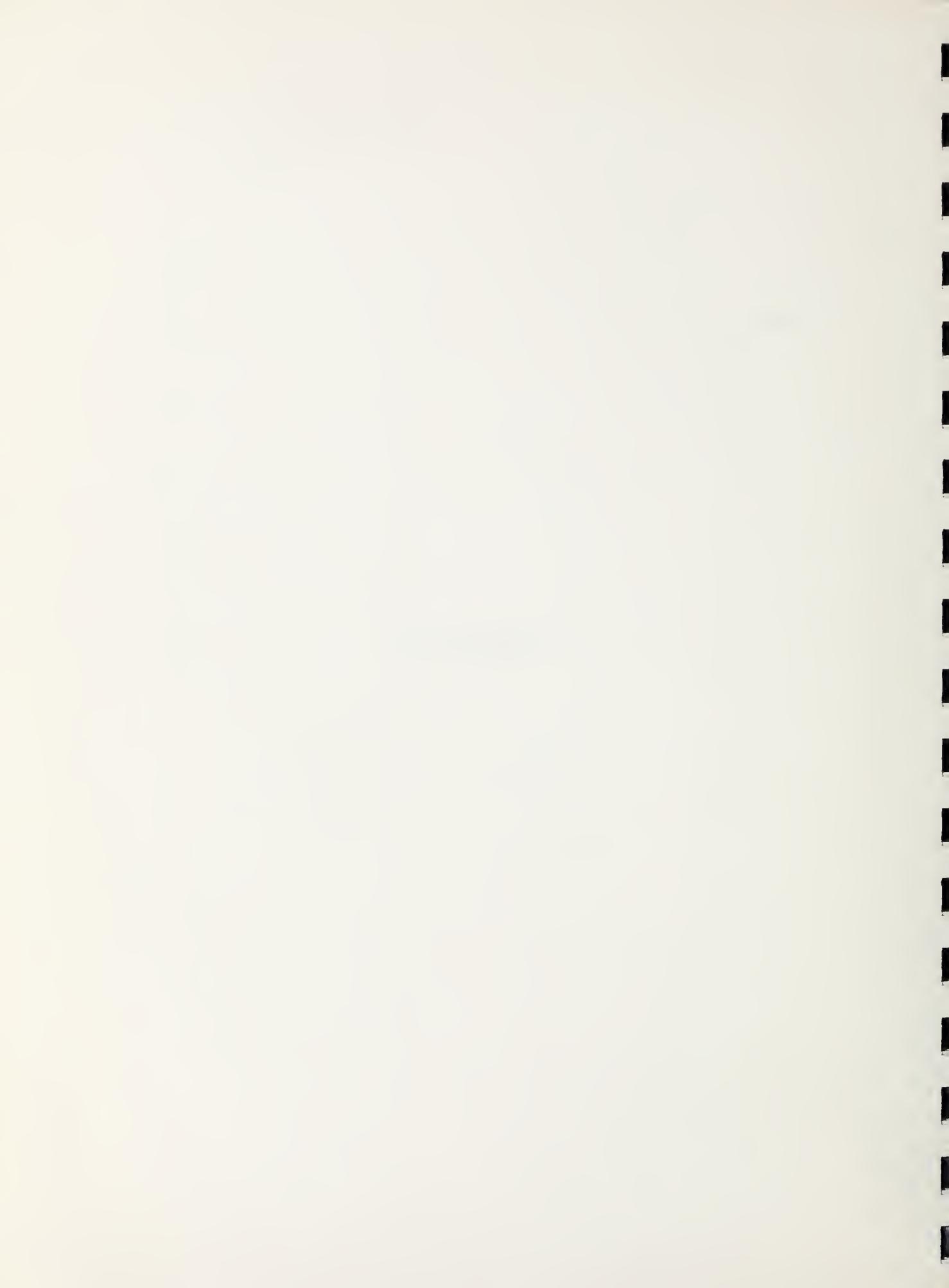
WATERSHED PLANTS

Multiflora Rose (*Rosa multiflora*)
 Common Winterberry Holly (*Ilex verticillata*)
 Mountain Laurel (*Kalmia latifolia*)
 American Yew (*Texus canadensis*)
 Black Oak (*Quercus velutina*)
 Spice Bush (*Lindera benzoin*)
 White Spruce (*Picea glauca*)
 Red Pine (*Pinus resinosa*)
 White Pine (*Pinus strobus*)
 American Beech (*Fagus grandifolia*)
 Hemlock (*Tsuga canadensis*)
 Blackberry (*Rubus allegheniensis*)
 Alternate-leaf Dogwood (*Cornus alternifolia*)
 Pin Cherry (*Prunus pensylvanica*)
 Low bush Blueberry (*Vaccinium angustifolium*)
 Black Locust (*Robinia pseudo-acacia*)
 Burning Bush (*Euonymous atropurpureus*)
 Gray Birch (*Betula populifolia*)
 Black Cherry (*Prunus serotina*)
 Basswood (*Tilia americana*)
 White Oak (*Quercus alba*)
 Yellow Birch (*Betula lutea*)
 Steeplebush (*Spiraea tomentosa*)
 Wintergreen (*Gaultheria procumbens*)
 Striped Maple (*Acer pensylvanicum*)
 Red Raspberry (*Rubus idaeus*)
 Chestnut Oak (*Quercus prinus*)
 Highbush Blueberry (*Vaccinium spp.*)
 Butternut (*Juglans cinerea*)
 Miniature Dogwood (*Cornus canadensis*)
 Plum (*Prunus spp.*)
 Bracken Fern (*Pteridium aquilinum*)
 Leathery Grape Fern (*Botrychium multifidum*)
 Christmas Fern (*Polystichum acrostichoides*)
 Ground Pine (*Lycopodium tirstadium*)
 Marginal Wood Fern (*Dryopteris marginalis*)
 Spinulose Wood Fern (*Dryopteris spinulosa*)
 Rheindeer Lichen (-)
 Bristly Clubmoss (*Lycopodium annotinum*)
 Ostridge Fern (*Onoclea struthiopteris*)
 Sensitive Fern (*Onoclea sensibilis*)
 Hayscented Fern (*Dicksonia punctilobula*)
 Strawberry (*Fragaria virginiana*)
 Sheep Sorrell (*Rumex acetosella*)
 Birdseye Speedwell (*Veronica chamaedrys*)
 Beech Drop (*Epifagus virginiana*)
 Pearly Everlasting (*Anaphalis margaritacea*)
 Yarrow (*Archillea millefolium*)
 Common St. John's Wort (*Hypericum perforatum*)
 Boneset (*Eupatorium perfoliatum*)
 Elecampane (*Inula helenium*)
 Indian Pipe (*Monotropa uniflora*)
 Orchard Grass (-)
 Sledge grasses (*Carex spp.*)
 Common Cattail (*Typha latifolia*)
 Solomon Seal (*Smilacina spp.*)
 Lily of the Valley (*Convallaria majalis*)
 Nightshade (*Solanum americanum*)
 Teaberry (*Gaultheria procumbens*)
 Arrow-Leaved Tear Thumb (*Polygonum sagittatum*)
 Evening Primrose (*Oenothera biennis*)
 Timothy (-)
 Queen Anne's Lace (*Daucus carota*)
 Arrowhead (*Sagittaria spp.*)
 Herb Robert (*Geranium robertianum*)
 Rainbow Polyporous (*Polyporus versicolor*)
 Shelf Fungi (*Fomes spp.*)

Witch Hobble (*Viburnum alnifolium*)
 Apple (*Pyrus malus*)
 Witch Hazel (*Hamamelis virginiana*)
 Staghorn Sumac (*Rhus typhina*)
 Burr Oak (*Quercus macrocarpa*)
 Buckthorn (*Rhamnus frangula*)
 Hawthorne (*Crataegus spp.*)
 Shrub Willow (*Salix spp.*)
 Soft Maple (*Acer rubrum*)
 Hop Hornbeam (*Ostrya virginiana*)
 Silky Dogwood (*Cornus amomum*)
 White Ash (*Fraxinus americana*)
 Shadblush (*Amelanchier spp.*)
 Myrtle (*Vinca minor*)
 Common Elderberry (*Sambucus canadensis*)
 Tulip Tree (*Liriodendron tulipifera*)
 Northern Arrowwood (*Viburnum recognitum*)
 American Hornbeam (*Carya ovata*)
 Red Oak (*Quercus rubra*)
 Bighoothed Aspen (*Populus grandidentata*)
 American Chestnut (*Castanea dentata*)
 Black Birch (*Betula lenta*)
 European Barberry (*Berberis vulgaris*)
 Partridgeberry (*Mitchella repens*)
 Grape (*Vitis spp.*)
 Quaking Aspen (*Populus tremuloides*)
 Trailing Arbutus (*Epigaea repens*)
 Broadleaf Spirea (*Spiraea latifolia*)
 Black Raspberry (*Rubus occidentalis*)
 Bristly Dewberry (*Rubus hispida*)
 Princess Pine (*Lycopodium obscurum*)
 Hairy Cap Moss(-)
 British Soldier Lichen (-)
 Bead Fern (*Onoclea sensibilis*)
 Pixie Cup Lichen (-)
 Broome Moss (*Dicranum spp.*)
 Staghorn Clubmoss (*Sycopodium clavatum*)
 Wood Horsetail (*Equisetum sylvaticum*)
 Interrupted Fern (*Osmunda claytoniana*)
 Maidenhair Fern (*Adiantum pedatum*)
 New York Fern (*Aspidium noveboracense*)
 Bunchberry (*Cornus canadensis*)
 Watercress (*Nasturtium officinale*)
 Winter Cress (*Brassica spp.*)
 Chickweed (*Stellaria spp.*)
 Giant Hyssop (*Agastache foeniculum*)
 Ox-Eye Daisy (*Chrysanthemum leucanthemum*)
 Narrow-leaved Plantain (*Plantago lanceolata*)
 Coneflower (*Composita*)
 Rough Avens (*Geum virginianum*)
 Square Stemmed Monkeyflower (*Mimulus ringens*)
 Goldthread (*Coptis groenlandica*)
 Goldenrods (*Solidago spp.*)
 Rice Cutgrass (*Leersia oryzoides*)
 Purple Vervain (*Verbena hastata*)
 Poisin Ivy (*Rhus radicans*)
 Ornamental Bamboo (*Smilax spp.*)
 Trillium (*Trillium spp.*)
 Purple Leaved Willow Herb (*Epilobium coloratum*)
 Dock (*Rumex spp.*)
 Common Milkweed (*Asclepias syriaca*)
 Common Mullein (*Berbascum thapsus*)
 Burreed (*Sparganium spp.*)
 Common Rush (*Juncus effusus*)
 Sharp Lobed Hepatica (*Hepatica acutiloba*)
 Puffballs (*Lycoperdaceae several spp.*)
 Hemlock Fungus (*Ganoderma tsugae*)



APPENDIX H



WATER QUALITY SURVEY

One stream gage station, three water quality stations, and eleven water temperature stations were selected to provide water quality base line data for this watershed. (See Figure .) The locations for these stations were chosen to yield the best data for determining overall water quality of the watershed, possible impact evaluations, and as indicators of best water uses under existing conditions. Water quality station #2 was located to provide base line data for the major fishery tributary, Oquaga Creek. Stations 1 and 3 were located to provide data for impact evaluations at a later date. The same reasoning applies to the gage on Butler Brook. The temperature stations were located on Oquaga Creek to provide this information for the fishery existing there. An effort was made to correlate the station locations with the different types of fisheries present in the stream system.

Water quality samples were taken monthly from spring until late fall. Temperatures were measured every two weeks during essentially the same period.

Water quality parameters were selected to not only provide data pertinent to the existing and future water use in the watershed, but also to provide information on general conditions that would be useful in a regional analysis.

A summary of these values appears in the following table:

DEPOSIT WATERSHED
SELECTED WQ PARAMETERS
(MEDIAN VALUES)

PARAMETERS	STA	STA	STA
	1	2	3
Total Alkalinity MG/L	17.5	17.5	22.5
Bicarbonate MG/L	21	21.5	27
Chloride MG/L	3.4	7.3	5.2
Fecal Coliforms/100 ML		127	7100
Fecal Strep/100 ML		28	345
Conductivity	76	82	97.5
Total Hardness MG/L	25	28.5	31.5
Total Nitrogen MG/L	.42	.42	1.04
Dissolved Oxygen MG/L	10.	10.6	9.6
pH	7.1	7.4	7.2
Total Phosphorous (P) MG/L	.04	.01	.04
Dissolved Solids MG/L	47.5	51	57
Sodium MG/L	2.8	3.9	3.8
Turbidity JTU	2	1	2.5
Suspended Solids MG/L	6	3.5	2

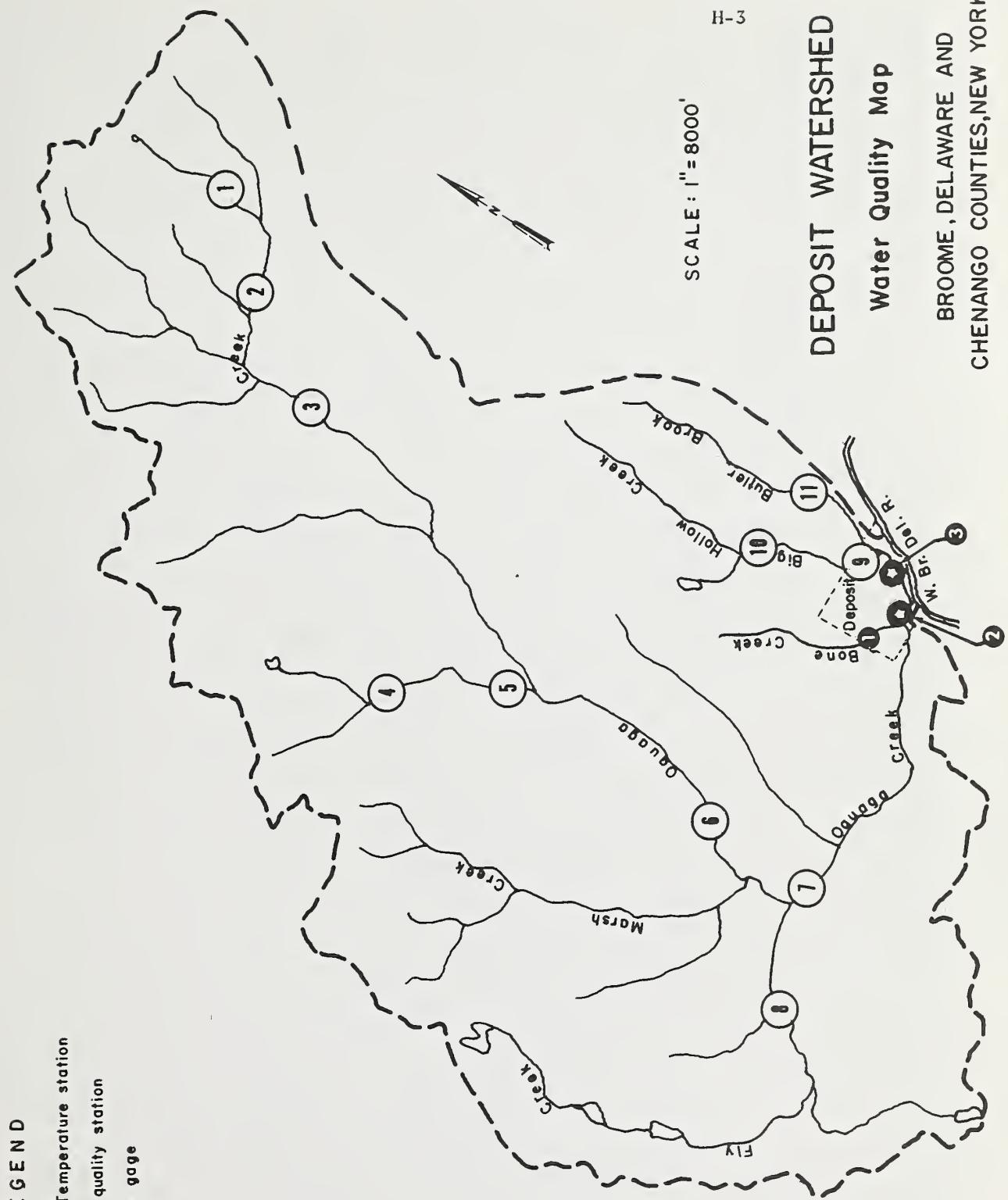
As a basis for comparison, the median values for selected parameters in Deposit watershed are compared with those published by the USGS for various surface waters in New York State. The high and low median values for the nine USGS stations are shown, along with the median value for the three stations in Deposit watershed.

	USGS		DEPOSIT		
	High	Low	1	2	3
Total Phosphorous	.18	.02	.04	.01	.04
Total Nitrogen	1.9	.5	.4	.4	1.04
Dissolved Solids	788	52	47.5	51	57
Specific Conductance	993	70	76	82	97.5
pH	8.2	6.5	7.1	7.4	7.2
Dissolved Oxygen	13.6	8.8	10	10.6	9.6
Percent Saturation	94	69	100.5	110	111

SCALE : 1" = 8000'

DEPOSIT WATERSHED

Water Quality Map

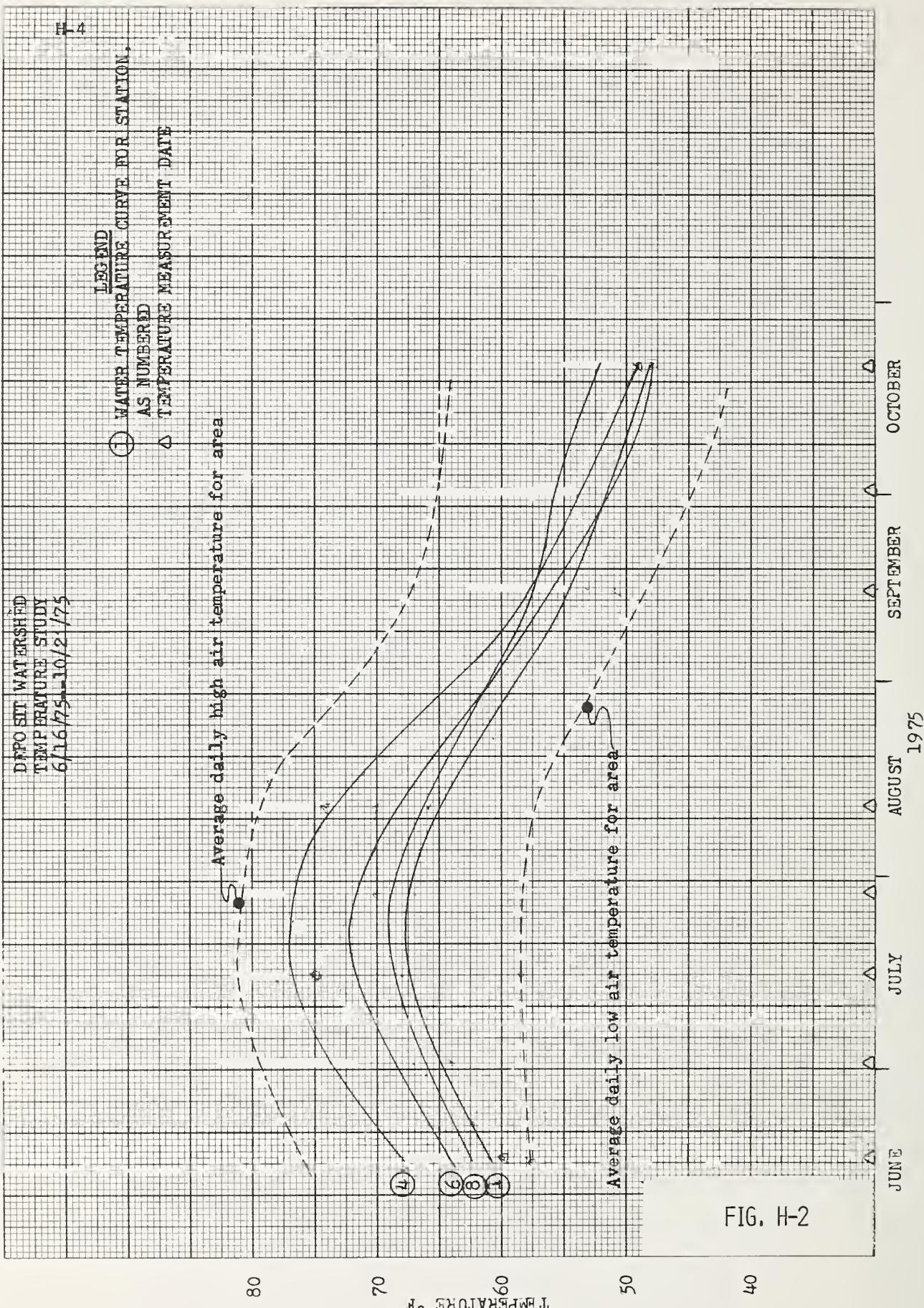
BROOME, DELAWARE AND
CHENANGO COUNTIES, NEW YORK

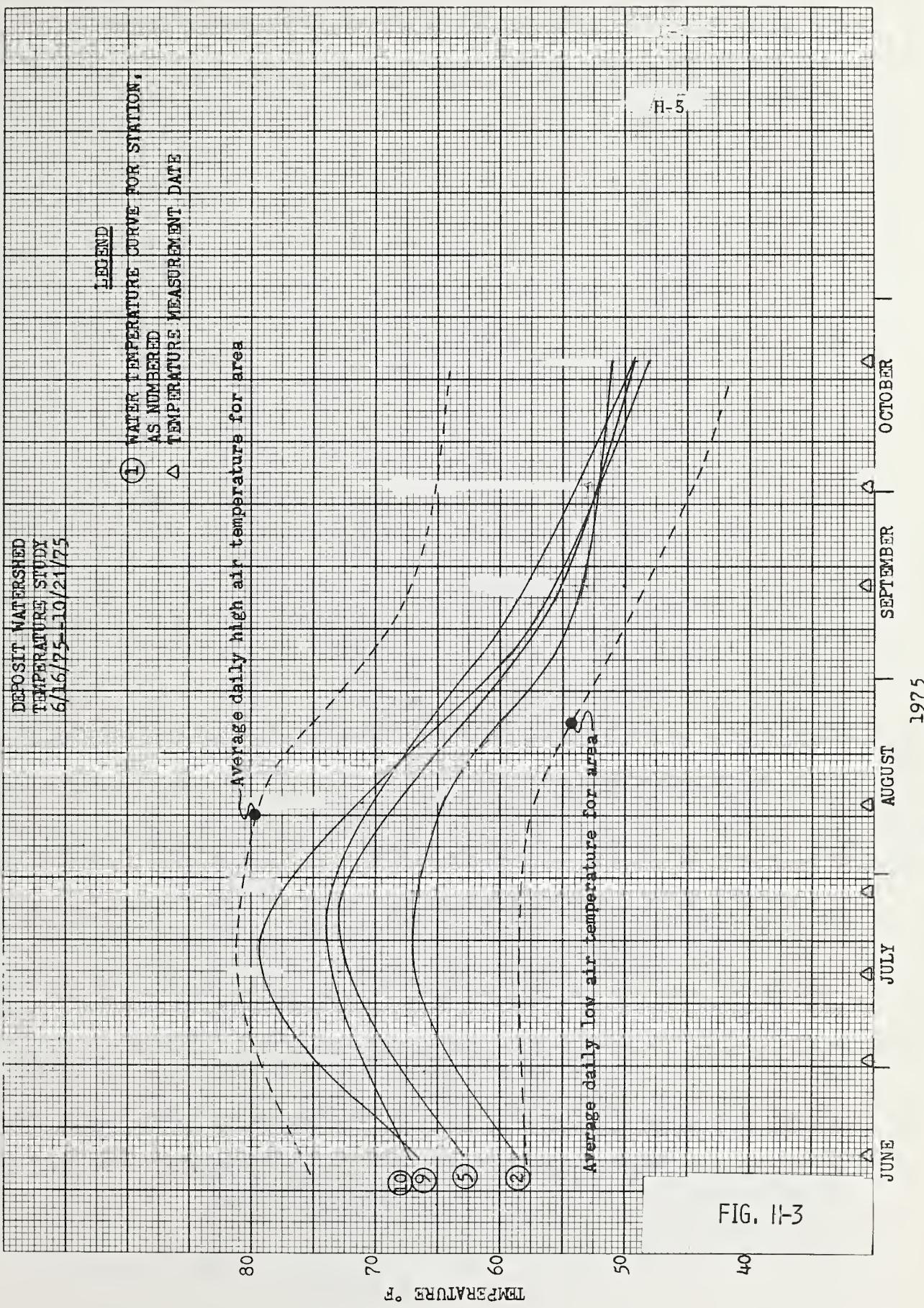
LEGEND

- (1) SCS Temperature station
- (2) Water quality station
- (3) Stream gage



FIG. H-1





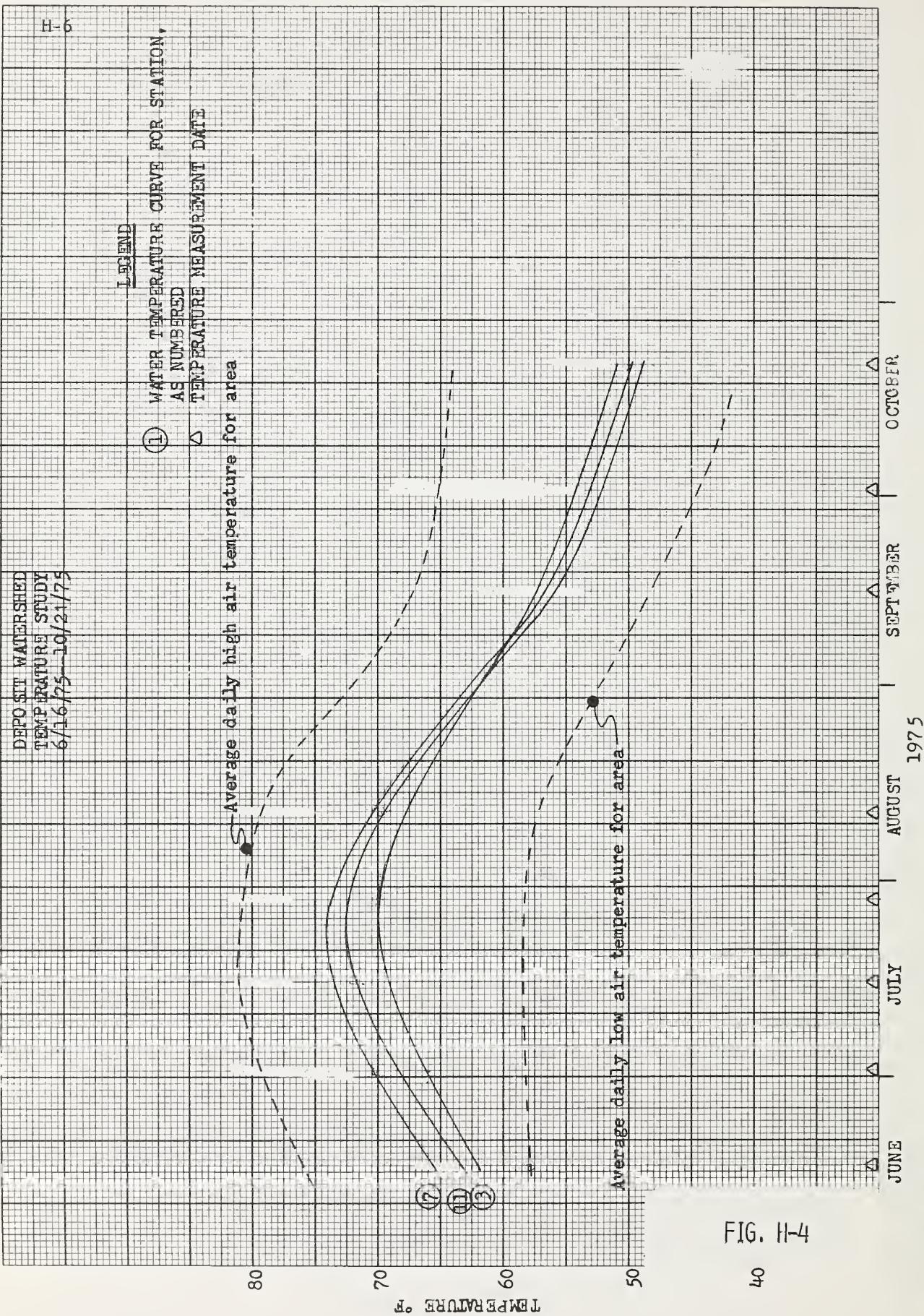


FIG. H-4

APPENDIX I



DEPOSIT WATERSHED HISTORIC STRUCTURE LOCATION MAP

1000 FEET
0
1000

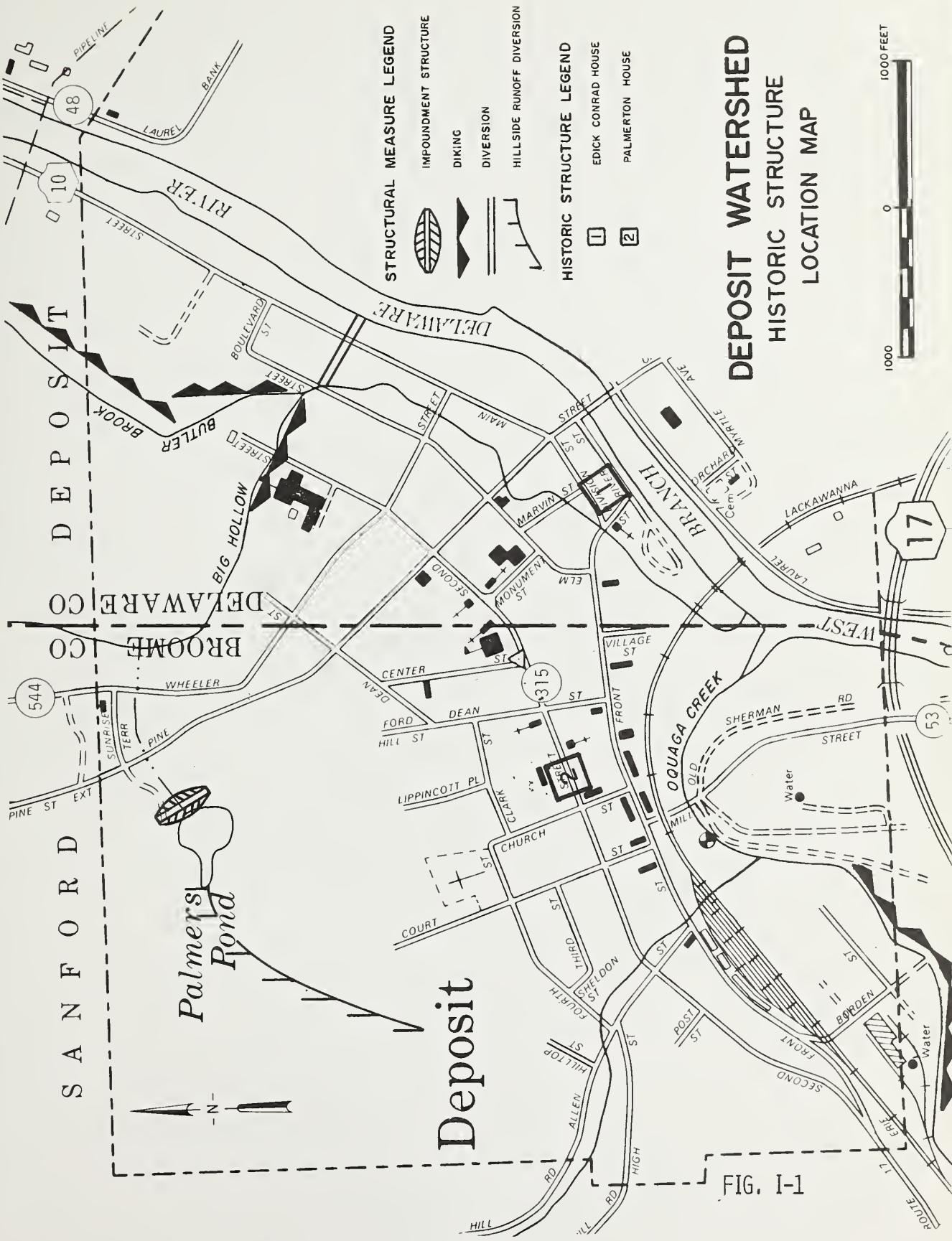
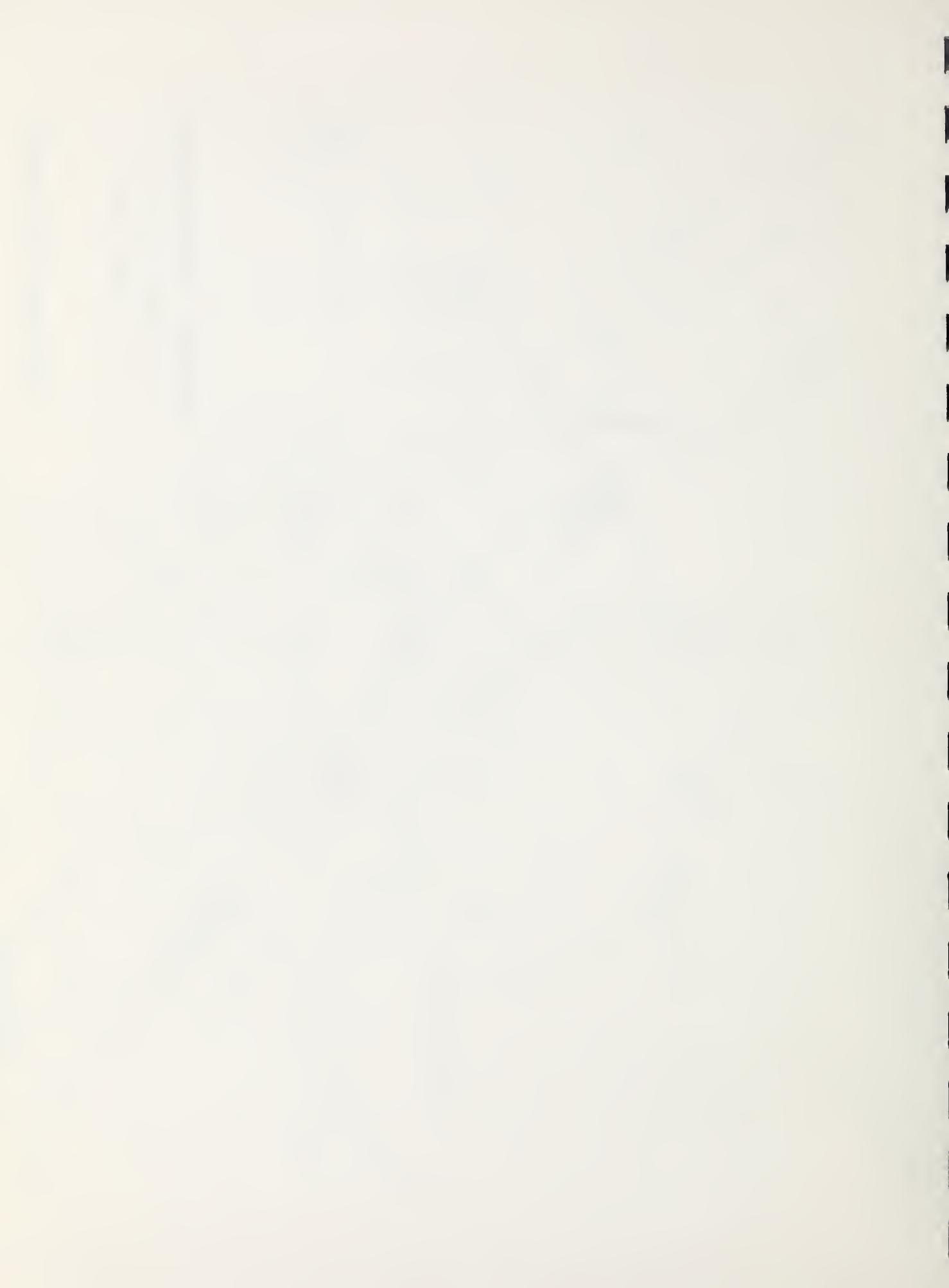
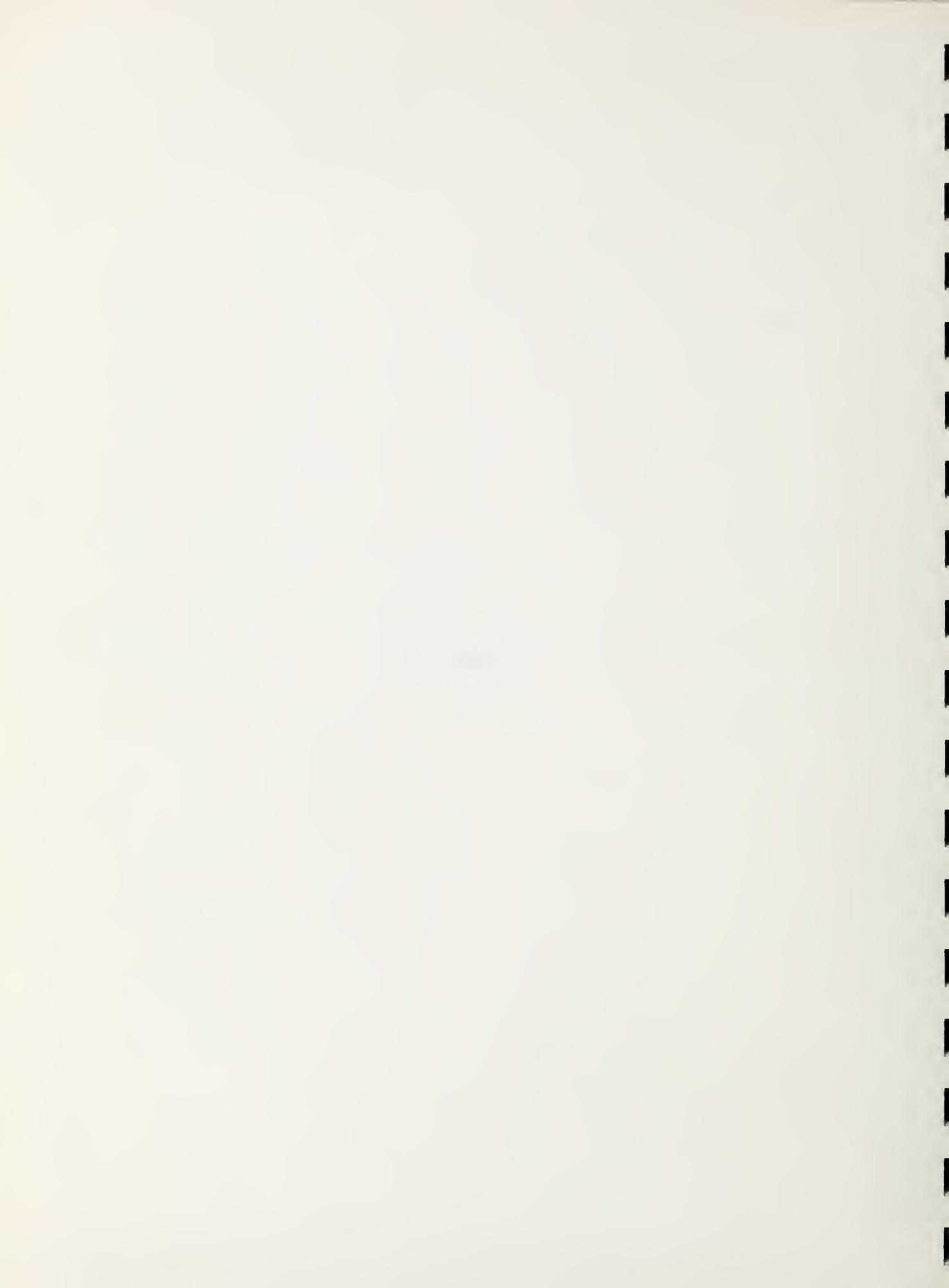


FIG. I-1



APPENDIX J



HSS
BSE
EFB



NEW YORK STATE PARKS & RECREATION Agency Building 1, Empire State Plaza, Albany, New York 12238 Information 518 474-0456
Orin Lehman, Commissioner

September 9, 1976

Mr. Robert S. Hilliard
State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
U.S. Courthouse & Federal Building
100 S. Clinton Street
Room 771
Syracuse, N.Y. 13202

Re: Deposit Watershed
Broome County

Dear Mr. Hilliard:

In response to your request of August 20, the State Historic Preservation Officer's staff has checked our files for cultural properties located in the above project area.

At the present time, we do not have any information on archeological resources in this area. With regard to historic structures, the following two buildings were recorded by the Historic American Buildings Survey:

Edick Conrad House, 1 River Street, Deposit
Pemberton House, 97 2nd Street

Since extensive structures and archeological surveys have not been conducted in this area, the information which we are able to provide must not be construed as representing all that is known about cultural resources here.

Should any construction be planned for the future, further investigation would be required.

Should you have any questions, please contact me at 518-474-3177.

Sincerely,

F.L. Rath, Jr.
Deputy Commissioner for
Historic Preservation

LRK:mmr



STATE UNIVERSITY OF NEW YORK AT BINGHAMTON

Binghamton, New York 13901

Department of Anthropology
Telephone (607) 798-2737

3 November 1976

Dr. Bernard S. Ellis
Senior Staff Geologist
USDA, Soil Conservation Service
100 South Clinton Street, Room 771
Syracuse, NY 13202

Dear Bernie,

Thank you for your letter of inquiry regarding the Deposit Watershed Project and its potential impact on cultural resources.

I have checked our site location maps, and we do not have any archaeological sites recorded from those areas delineated on your maps. Of course, this is because no one has ever looked in those specific areas, at least in part.

Our research in similar areas in southern New York on flood plains and in upland areas where glacial geomorphological features intrude into stream valleys, suggests that such areas have a high likelihood of containing significant cultural resources eligible for the National Register of Historic Places.

I would hope that your review of the potential impacts of this project would include our opinion that the negative data are insignificant, inasmuch as no systematic survey has ever been done in this area. We must adhere to the null hypothesis that we simply do not have sufficient data to predict the potential impact of your project on cultural resources.

I hope that these results are of use to you. Do not hesitate to let us know if we may be of further service.

Sincerely,

Albert A. Dekin, Jr.
Director, Public Archaeology
Facility

